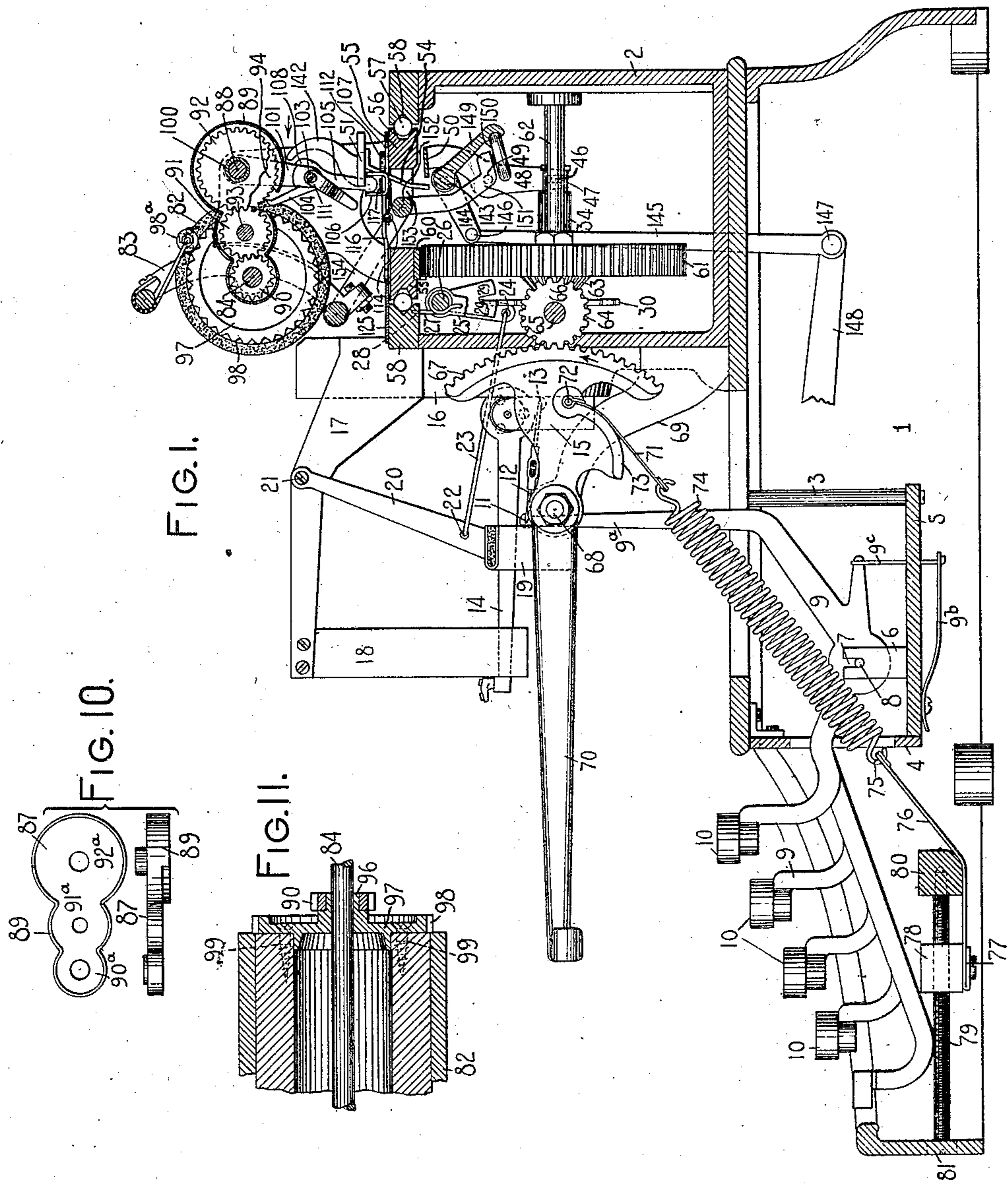


No. 849,829.

PATENTED APR. 9, 1907.

A. T. BROWN.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 16, 1902.

3 SHEETS—SHEET 1.



WITNESSES.

K. V. Donovan.
Charles Smith

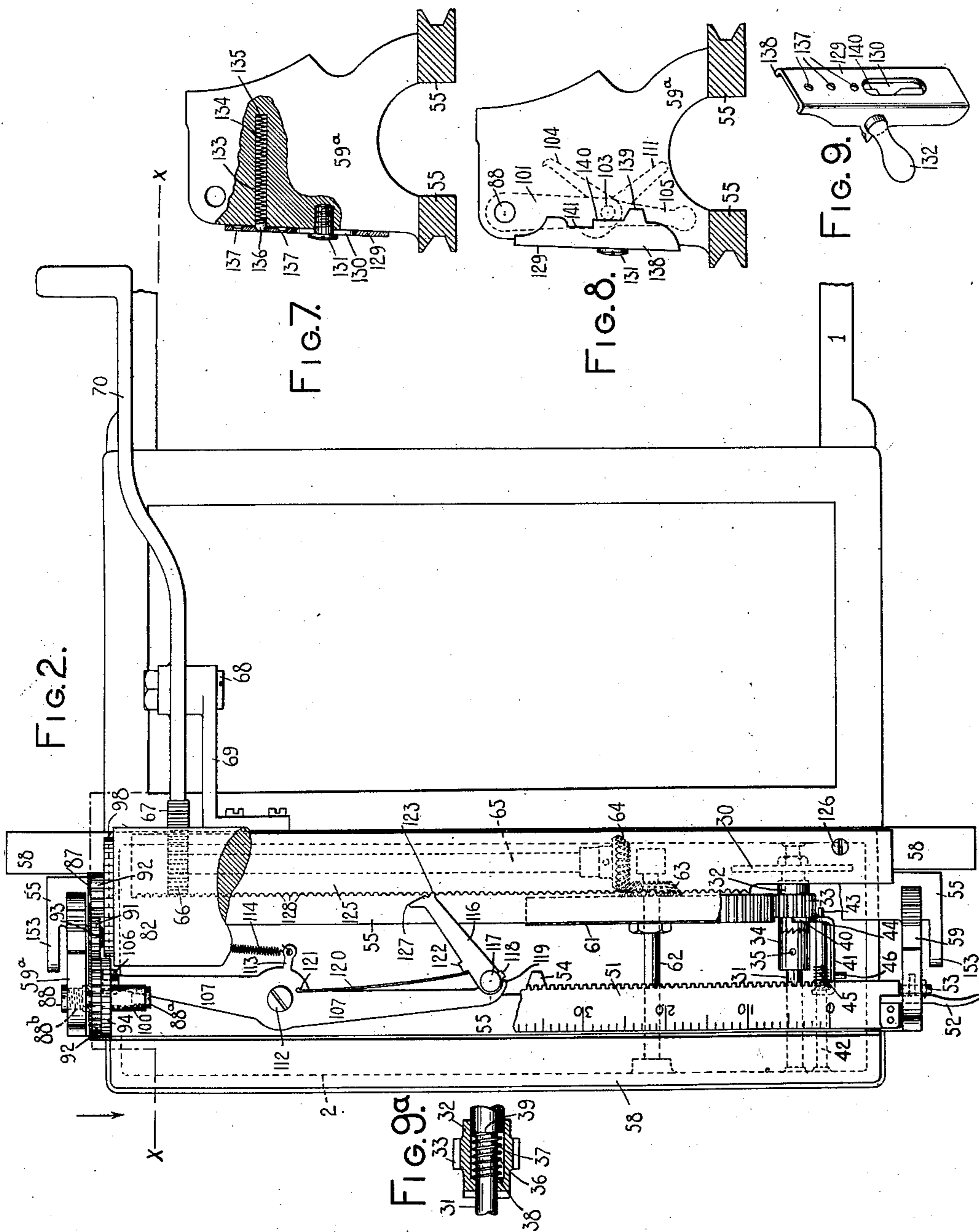
INVENTOR
Alexander T. Brown
by
James Felber
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3 SHEETS—SHEET 2.



WITNESSES.

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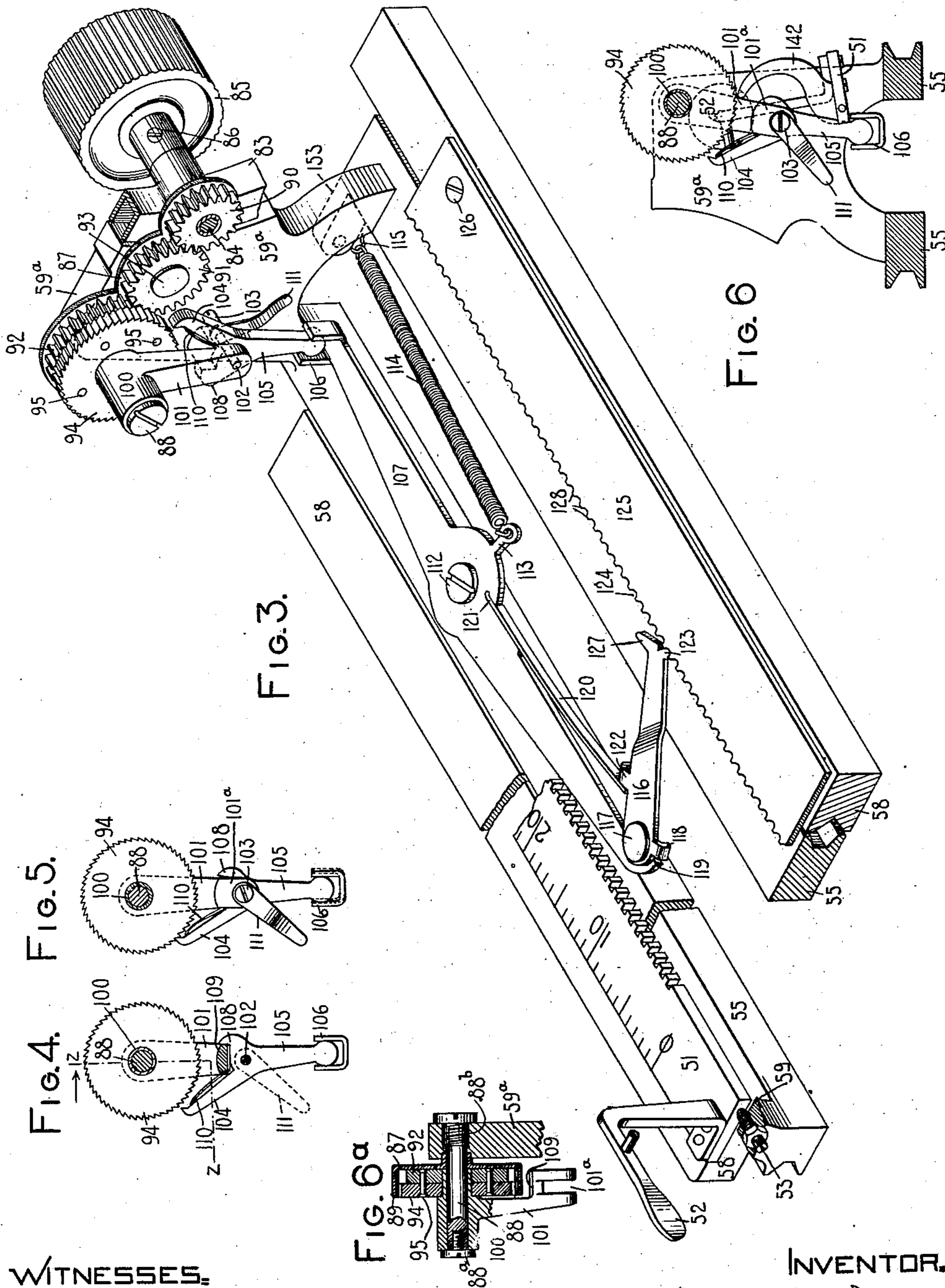
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3 SHEETS—SHEET 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

No. 849,829.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed October 16, 1902. Serial No. 127,543.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My present invention relates to line-spacing mechanism for type-writing machines; and the main object of the invention is to provide simple and efficient mechanism for automatically effecting a line-spacing movement of the platen during the return of the carriage.

To these and other ends, which will hereinafter appear, my invention consists in the novel features of construction, arrangement of parts, and combinations of devices to be hereinafter described and claimed.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a front-to-rear vertical sectional view of one form of type-writing machine embodying my invention, the section being taken on the line $x x$ of Fig. 2 and looking in the direction of the arrow in said figure. Fig. 2 is a plan view of the same with parts omitted and parts broken away. Fig. 3 is a detail perspective view, on an enlarged scale, of line-spacing mechanism. Figs. 4 and 5 are detail side views of portions of the line-spacing mechanism, the views illustrating different dispositions of the parts. Fig. 6 is a side view of portions of the line-spacing mechanism and the carriage on which the parts are mounted. Fig. 6^a is a fragmentary transverse sectional view of a portion of the line-spacing mechanism taken on the line $z z$ of Fig. 4. Fig. 7 is a side view of one of the end plates of the carriage with parts broken away, the view illustrating in section the regulating device for controlling the extent of line-spacing movement. Fig. 8 is a side view of the same. Fig. 9 is a detail perspective view of the device for controlling the extent of line-spacing movement. Fig. 9^a is an enlarged detail longitudinal sectional view taken through the escapement-shaft and pinion. Fig. 10 represents in side elevation and plan one of the links to which the platen is connected. Fig. 11 is a longitudinal sectional view, on an enlarged scale, taken through the right-hand end of the platen.

In the various views parts have been omit-

ted or broken away to more clearly illustrate other features of the machine.

I have illustrated my invention applied to a front-strike type-writing machine, though it should be understood that the various features of the invention may be embodied in other characters of writing-machines.

The frame of the machine comprises a base 1, surmounted by a frame or casting 2, which supports the carriage and various working and fixed parts of the machine, as will hereinafter more clearly appear. Depending from the upper side of the base 1 are arms or rods 3, which, together with a supporting-plate 4, constitute supports for a platform 5, that is provided with upwardly-projecting bearing-studs 6, recessed at 7 for the reception of pivots 8 of the key-levers 9. Each key-lever is provided at its forward end with a finger-key 10 and has its opposite end connected at 11 to a draw-link 12, the opposite end of which is connected at 13 to a projection that extends from a type-bar 14. The type-bars 14 are supported upon hangers 15, which are secured to a segment 16, supported upon the casting or frame 2. Extending forwardly from the segment are arms 17, to the outer ends of which a segmental support 18 is secured to support the forward ends of the type-bars. The upright arm 9^a of each key-lever extends into the path of a segmental universal bar 19, connected at or near its ends to upright arms 20, that are pivoted at 21 to the forwardly-projecting brackets 17. Each of the arms 20 is connected at 22 to a rearwardly-extended link 23, the rear end of which is connected at 24 to a depending crank-arm 25, extending from a rock-shaft 26, mounted in the frame 2 and extending from side to side of the machine. This rock-shaft and the parts carried thereby are restored to the normal position by a coiled spring 27, that surrounds the shaft and is connected at one end 28 to a portion of the fixed frame 2 and at its opposite end to one of the depending crank-arms 25, whereas a spring 9^b, connected through a link 9^c to each key-lever, restores it and the associated type-bar to the normal position when pressure on the finger-key is released. The rock-shaft 26 carries two rigid feed-dogs 29, which cooperate with an escapement-wheel 30 to afford a step-by-step feed movement of the carriage. The escapement-wheel 30 is rigidly secured to a shaft 31, (see Fig. 2,) that is mounted in bearings in the frame 2 and has

a loosely-mounted surrounding-sleeve 32, which is provided with a pinion 33. The rear end of the sleeve 32 is formed as one member of a two-part clutch, the other member of which is formed by a like sleeve 34, that surrounds the shaft and is rigidly secured thereto by a pin 35. As shown in Fig. 9^a, the sleeve 32 is provided with a recess or chamber 36, that contains a coil-spring 37, which surrounds the shaft 31 and bears at one end against an end wall 38 of the chamber 36 and at its opposite end against a shoulder 39, formed on the shaft 31. The spring 37 is an expansion-spring, and therefore tends to normally maintain the clutch-sections in engagement, as represented in Fig. 2. A fork or yoke 40 straddles the sleeve 32 and bears against one side of the pinion 33. The body portion or carrier 41 of the fork is of general U shape and is perforated for the reception of a fixed pin 42 and a contracted extension 43 at the end thereof and on which the yoke is adapted to slide. The shoulder 44, formed at the junction of the contracted portion 43 and the pin, constitutes an abutment which limits the movement of the yoke toward the rear of the machine, and a coiled spring 45 surrounds the pin 42 and is connected at one end thereto, and the opposite end bears upon one of the ends of the body of the yoke and tends to force the yoke toward the rear of the machine. The body of the yoke is provided with a laterally-projecting pin 46, which is received within an elongated slot 47 (see Fig. 1) in a lever 48, which is pivoted at 49 and carries a bar 50 at its upper end, that extends transversely from side to side of the machine, the opposite end of said bar being provided with a link or arm pivoted to the frame of the machine in a similar manner to the lever 48. A rock-bar 51 is carried by the carriage and has a finger-piece 52, by means of which it may be turned on its pivots 53. (See Fig. 2.) The rock-bar has a depending finger 54 adapted to cooperate with the cross-bar 50 irrespective of the position of the carriage or at any point in the movement thereof from side to side of the machine. When the finger-piece 52 is moved toward the front of the machine, the depending finger will be moved rearwardly, thus moving the bar 50 in a like direction and forcing the yoke 40 toward the front of the machine. The effect of this movement is to move the sleeve 32 and its pinion forwardly, thereby disconnecting the clutch-sections without moving the pinion out of mesh with its companion gear. The effect of this disconnection of the clutch-sections is to entirely release the carriage from the escapement mechanism, as will hereinafter more clearly appear. When the carriage is grasped at any suitable portion thereof and moved from left to right without moving the release-key 52, the clutch-section 32 will be cammed

out of engagement with its companion clutch-section and against the tension of the spring 37 by the sloping walls of the engaged teeth of the two clutch-sections, so that the teeth of the section 32 will jog over the teeth of the section 34, while the escapement-wheel will remain at rest, being engaged by one of the feed-dogs.

The carriage comprises cross-bars 55, which have tracks or grooves 56 therein for the reception of antifriction rollers or balls 57, that are likewise received in companion raceways or tracks 58, secured to the frame 2 of the machine. Extending upwardly and uniting the cross-bars 55 are end plates 59 and 59^a, which constitute supports for various portions of the carriage structure. Secured to one of the cross-bars 55 of the carriage is a feed-rack 60, which is in constant mesh with a gear-wheel 61, rigidly connected to a shaft 62, supported in bearings in the frame 2 of the machine. This gear-wheel 61 is provided with a beveled pinion 63, that meshes with a companion bevel-pinion 64 on a shaft 65, supported in suitable bearings in the frame 2. The opposite end of the shaft 65 is provided with a gear-wheel 66, with which a toothed segment 67 meshes. This toothed segment is pivoted at 68 to a forwardly-extending bracket 69 and is extended at 70 to form a handle by means of which the segment and the parts controlled thereby may be moved. The segment has a strap or band 71 secured thereto at 72 and which is adapted to bear upon a segmental portion 73, formed on the body portion of the toothed segment. The opposite end of this strap is connected to a contractile spring 74, which is connected at its opposite end 75 to a strap 76, that has its opposite end secured by a screw 77 to a block 78, tapped and received on the threaded rod 79, which is loosely supported at its rear end in a fixed bearing 80 and at its forward end in the base 1 of the machine, the forward end being provided with a nicked head 81, whereby the rod may be turned to effect an adjustment of the block 78 to vary the tension on the spring 74.

From the foregoing description it will be understood that the spring 74 constitutes a carriage-spring which exerts pressure on the toothed segment 67, the companion gear-wheel 66, the bevel-gears 64 and 63, and through the gear-wheel 61 to the rack on the carriage and tends to move the carriage from right to left. During this movement of the carriage from right to left the hand-lever 70 will receive an upward movement, so that it arrives at its highest point when a complete movement of the carriage has taken place. It will likewise be understood that a depression of the lever 70 will cause the toothed segment 67 to be moved in the direction of the arrow adjacent thereto, thereby turning the various gears in an opposite direction

from that which they receive during the feed movement of the carriage, and the pressure thus applied to the lever 70 forces the carriage from left to right in order to restore it to its initial position to begin a new line of writing, and the spring 74 is at the same time stretched to increase its tension. During the actuation of the machine a depression of any of the finger-keys will cause the corresponding upright arm 9^a of the lever to vibrate the segmental universal bar 19, thus moving the feed-dogs 29 toward the front of the machine. When the finger-key is released, the feed-dogs will be moved toward the rear of the machine by their spring and a letter-space feed movement of the escapement-wheel 30 will be effected. The pressure exerted by the spring 74 will tend to move the various gears in the manner heretofore described to move the carriage a letter-space distance when the escapement mechanism has been actuated in the manner described.

The platen 82 is adapted to rotate in its platen-frame 83, through which the shaft 84 of the platen extends, the platen-shaft having a finger-wheel 85 secured to each end thereof by a screw 86 and by means of which the platen may be turned in either direction. The platen shaft and frame are supported at one end by a suitable link that is pivoted to the end plate 59. The shaft and platen-frame are supported near its opposite end by a link 87, which is shown in detail in Fig. 10 and which is pivoted upon a headed screw-pivot 88, that extends through the end plate 59^a of the carriage (see Fig. 6^a) and through the link. The link 87 is provided with a flange 89, that projects laterally therefrom around its entire edge and conforms at various portions thereof to the general contour of the gears, which are contained within the flange. Thus the gear 90 is received within the flange at that portion indicated at 90^a, whereas the gear 91 is received within that portion of the flange indicated at 91^a, and the gear 92 is received within that portion of the flange indicated at 92^a. These three gears 90, 91, and 92 are in mesh, the gear 91 being in the nature of an idler or intermediate which is carried by a headed pintle 93, that projects laterally from the link 87. It will therefore be seen that the link 87 not only constitutes a link, but likewise forms by its flange a protective housing for the various gears. A ratchet-wheel 94 is located adjacent to the gear-wheel 92 and is secured to rotate therewith by pins 95, which extend through the ratchet-wheel and gear. The gear-wheel 90 is rigidly connected to a collar 96, formed on the platen-head 97, as indicated in Fig. 11, whereas peripheral teeth 98 are formed on the head, so as to constitute a line-spacing detent-wheel with which a detent 98^a cooperates, the platen-head itself being secured to the core of the platen by

screws 99, and the platen-shaft 84 may be secured to the platen by any suitable means. Thus it will be understood that motion transmitted from the gear 92 through the idler or intermediate 91 and gear 90 will effect a line-spacing movement of the platen.

A sleeve 100 is loosely seated upon the fixed pintle 88 and is extended outwardly to form a bearing for the wheels 92 and 94, and the sleeve is prevented from being removed from the pintle by the head of a separate screw 88^a, the stem of which is received within a threaded opening in the end of the pintle 88, Fig. 6^a, whereas the pintle itself is held in place on the end plate 59^a of the carriage by a threaded portion 88^b engaging in a threaded opening in the end plate. The sleeve 100 is provided with a depending arm 101, that is bifurcated at its lower end, as indicated at 101^a, and has a pivot-pin 102 extending through the bifurcated portion, and the head 103 of the pivot extends beyond the outer side of the bifurcated portion for purposes which will hereinafter appear. This pin constitutes a pivot for a line-spacing pawl 104, which is received within the bifurcation and has a depending arm 105 rounded at its lower end for cooperation with the forked portion 106 of a lever 107. The pawl 104 is provided with an upwardly-extending lug 108, adapted to bear against the cross-bar 109 of the bifurcated portion of the arm 101, and thus limit the movement of the pawl in one direction, as represented in Fig. 4. A spring 110 is connected at one end to the cross-bar 109 and bears at its free end against the pawl in order to assist in throwing the engaging nose thereof out of engagement with the teeth of the ratchet-wheel 94. A friction-spring 111 is perforated at one end in order that it may be seated on the screw-pivot 102 between the head 103 thereof and one side of the bifurcated portion 101^a of the arm 101. This friction-spring is bent laterally, as indicated in Fig. 3, and the free end thereof bears at all times against the inner side of the end plate 59^a of the carriage. The tension and frictional contact of the spring 111 exceeds the tension of the spring 110, so that a movement of the right-hand end of the lever 107 toward the front of the machine is effective to force the pawl 104 into engagement with the teeth of the ratchet-wheel 94 before any movement is transmitted to the arm 101. The lever 107 is pivoted at 112 to one of the cross-bars 55 of the carriage and is provided with a laterally-extending lug 113, to which one end of a contractile spring 114 is connected, the opposite end of said spring being connected at 115 to a fixed portion of the carriage; so that the tension of the spring 114 normally tends to force the lever in a direction opposite to that indicated by the arrow in Fig. 2.

The opposite end of the lever from that

which carries the fork 106 has a controlling-pawl 116 pivoted thereto at 117, and a depending lug 118, carried by the pawl, is adapted to abut against a shoulder 119, carried by the lever 107, to limit the movement of the pawl in one direction relative to the lever. The lever 107 has a spring 120 secured thereto at 121, the opposite end of said spring bearing against a shoulder 122 on the pawl, so that the tension of the spring 120 is exerted on the pawl and tends to maintain the lug 118 in contact with the shoulder 119 on the lever. The free end of this so-called "controlling-pawl" is provided with a teat 123, which is rounded and conforms generally to the spaces or serrations 124 in a rack 125, secured by screws 126 to one of the rails or tracks 58, secured to the frame 2 of the machine. The free end of the pawl is likewise provided with a smooth-faced shoe 127, that is adjacent to the teat 123, and the relation of the parts is such that the shoe is maintained out of contact with the rack when the pawl is in the position indicated in Fig. 2 and maintains this position throughout the movement of the carriage in the direction of its feed, or from right to left, the teat on the pawl at this time jogging over the teeth of the rack 125 and the line-spacing pawl 104 being maintained out of engagement with its cooperating line-space ratchet-wheel 94. The platen at this time will be maintained in the position to which it has been moved by the detent 98^a bearing on the wheel 98. As soon as the carriage starts to move in an opposite direction, or from left to right, in order to begin a new line of writing the free end of the pawl 116 will be maintained fixed by the rack throughout the initial portion of this movement, whereas the carriage, with its lever 107, will be moved to the right, so that the relative disposition between the pawl 116 and the lever 107 will be changed. Thus while the carriage is being moved from right to left the pawl 116 is at an acute angle to the lever 107. When, however, the carriage moves from left to right, the free end of the pawl will be rocked on and maintained in engagement with its rack 125 and the lever 107 will continue to move with the carriage, thereby gradually increasing the acute angle between the pawl 116 and its lever 107 until the lug 118 is arrested by contact with the shoulder 119, at which time the pawl and lever are at substantially right angles one to the other, and the pawl will then move bodily with the lever and carriage. During this relative movement of the pawl to the lever a movement of the lever around its pivot 112 has been effected, and this movement is effective to first turn the line-spacing ratchet-pawl 104 on its pivot 102 against the tension of the spring 110 from the position shown in Fig. 4 to that indicated in Fig. 5 in order to bring the nose of the pawl into contact with the

teeth of the line-spacing ratchet-wheel. After such engagement has been attained a further relative movement between the line-spacing ratchet-pawl and the arm 101 cannot take place, so that the two parts are moved together by the lever 107 to effect a line-spacing movement of the ratchet-wheel, which is transmitted through the intermediate gears to the platen. During this movement of the pawl 104 and its arm or carrier 101 the friction-spring 111 will be carried over the surface of the end plate 59^a of the carriage, with which it is maintained in contact. When the pawl 116 has attained its position at right angles to the lever 107, the teat 123 will be moved out of effective or meshing engagement with the teeth of the rack 125 and the flat face of the shoe 127 will be brought into alinement with the flat crowns 128 of the teeth on the rack and the pawl will be permitted to slide along the teeth with the carriage to maintain the parts in the positions to which they have been moved. As soon, however, as the carriage starts to move in an opposite direction, or from right to left, the controlling-pawl will be rocked against the tension of its spring 120 and the teat 123 on the pawl will be seated in a serration 124, so as to be engaged by the teeth formed thereby, and the pawl will be rocked around its pivot 117. The disposition of the pawl relative to the lever being thus changed to an acute angle, the tension of the spring 114 will move the right-hand end of the lever 107 toward the rear of the machine. The first effect of this movement is to immediately throw the nose of the pawl 104 out of engagement with the teeth of the ratchet-wheel 94, the spring 110 assisting in this movement. When this initial movement of the pawl out of engagement with the teeth has been effected, the lug or stop 108 on the pawl is brought into engagement with the cross-bar 109 on the carrier 101, and the carrier 101 and pawl are then moved together back to the initial position where the pawl is in a position to engage the desired tooth on the ratchet-wheel to effect the proper line-spacing movement when the carriage is again moved to the right. In order that this extent of line-spacing movement may be varied, I have provided a regulating device which is shown in detail in Figs. 7, 8, and 9 and which consists of a plate 129, that has an elongated opening 130 therein for the reception of the stem of a headed screw 131, the stem of the screw taking in a threaded opening in the rear edge of the end plate 59^a of the carriage. By these means a vertical movement of the regulating-plate 129 may be effected, and a handle or finger-piece 132 is provided on the plate in order to afford a movement thereof to the desired position. The end plate 59^a of the carriage has a recess 133 therein, which contains an expansion-spring 134, one end of said

spring bearing against an end wall 135 of the recess and the opposite end of the spring bearing against a locking-ball 136, which is received and travels in the recess and may be seated in any one of three depressions 137 in one face of the controlling-plate 129 in order that the plate may be maintained in any one of three positions to which it may be moved by the handle 132. A pressure exerted upon the handle will move the ball against the tension of its spring, thus displacing the ball, and when the next depression 137 is brought opposite the ball it will be automatically forced into the depression, thereby retaining the plate in the position to which it has been moved. The plate 129 has a general U-shaped conformation, and the sides thereof bear upon opposite sides of the end plate 59^a of the carriage in order to guide the plate. The inner edge or side 138 of this controlling-piece is provided with three faces, steps, or abutments 139, 140, and 141, respectively, with which the head 103 of the screw-pivot 102 is adapted to abut, as indicated in dotted lines in Fig. 8, thus limiting the swinging movement of the arm 101 toward the rear of the machine around its pivotal center. Thus if the controlling-piece 129 is adjusted so that the abutment 139 thereon is brought into the path of the head 103 of the pivot the abutment will provide the shortest extent of throw to the carrier or arm 101, so that the extent of line-spacing movement will be accordingly lessened, whereas if the controlling-plate is moved to bring the abutment 141 into the path of the head 103 of the screw-pivot the longest extent of throw of the arm 101 is provided and the greatest extent of line-spacing movement of the platen is therefore afforded.

In order that the carriage may be moved from left to right without line-spacing when desired, I have provided the rock-bar 51 with an upwardly-extending curved finger 142, which projects in the path of movement of the carrier 101, so that when the release-key 52 is actuated to release the carriage it will cause the finger 142 to move the arm or carrier 101 forwardly, or to the left in Fig. 6, and thereby effect a slight rocking of the pawl 104 around its pivot-pin 102, so as to move and maintain it out of engagement with the line-spacing ratchet-wheel, and when an automatic actuation of the controlling-pawl 116 and lever 107 takes place during the movement of the carriage from left to right it will be ineffective to turn the platen by reason of the fact that the pawl 104 is maintained out of engagement with its cooperating ratchet-wheel 94. It will thus be seen that an automatic line-spacing of the platen may or may not be effected during the return of the carriage from left to right in accordance with the desire of the operator.

While any suitable mechanism may be em-

ployed for shifting the platen for upper and lower case printing, that shown in the present instance consists of a rock-shaft 143, that extends from side to side of the machine and is supported in suitable bearings in the frame 70. This rock-shaft is provided with a crank-arm 144, to which the upper end of the link 145 is pivoted at 146, the lower end of said link being pivoted at 147 to a suitable actuating-lever 148, that may be provided with a key (not shown) which extends to the keyboard of the machine. The rock-shaft 143 has a plate 149, that extends throughout the length thereof and is rigidly secured to or formed integral with the rock-shaft. An antifriction-roller 150 is pivoted to a depending arm 151, that extends from a rock-shaft 152, mounted to rock in bearings 153, which project forwardly from one of the cross-bars 55 of the carriage. This rock-shaft is provided with forwardly and upwardly projecting arms 154, one at each end thereof, the forward ends of these arms being pivoted to the platen-frame 83. A depression of the finger-key connected to the lever 148 will cause the link 45 to be elevated, thereby rocking the shaft 143, and the effect of this movement is to vibrate the rock-shaft 152 on the carriage, thus shifting the platen-frame and platen on the links, one of which consists of the link 87, around the pivotal center 88, thereby moving the platen from the lowermost position to the upper position, where it may cooperate with the types on the outer ends of the type-bars. When the shift-key is released, the platen and the parts connected thereto are restored to normal positions by the weight of the platen and its associated parts and by such suitable springs as may be found necessary.

From the foregoing description it will be understood that a portion of the automatic line-spacing mechanism (the rack 125) is carried by a fixed portion of the machine, whereas other portions of the line-spacing mechanism are carried by the carriage and cooperate with the relatively fixed portion or rack to automatically actuate the line-spacing mechanism during the initial portion of the return movement of the carriage to the right and that the automatic line-spacing is effected independently of the means employed to return the carriage to the right. It is unnecessary, therefore, to move the carriage to its extreme right-hand position in order to effect an automatic line-spacing.

The fact that the actuation of the line-spacing mechanism is entirely independent of the means employed for restoring the carriage to the right enables me to use any suitable means for this purpose, and from certain aspects of my invention it is immaterial what character of means are employed for returning the carriage to the right, whether it be the ordinary hand-lever or any other suitable

means, or the carriage may be grasped by any suitable portion thereof and pushed to the right, and yet the automatic line-spacing will be effected.

5 The structure is such that the intermeshing gears 90, 91, and 92 are in constant mesh and are connected to the platen and platen-frame and likewise to the carriage. It will also be seen that the gear 92 turns on a piv-
10 otal center coincident with the center on which the platen is vibrated to change the case position thereof, so that this movement of the platen may take place without in any way effecting the meshing engagement or
15 connection between the various gears. It will also be understood that the gears 90 and 91 vibrate bodily with the link 87 and platen around the pivotal center on which the platen is moved during the shifting thereof to change
20 the case position of the platen—in other words, that the platen swings on links and is shiftable transversely of its length and relatively to the carriage to change the case position of the platen. Furthermore, a line-
25 spacing wheel 94 and a gear 92 are carried by the carriage and turn on the center on which the links swing, and movement is transmitted from the line-spacing wheel and gear 92 on the carriage to the platen through means
30 or gear connections carried by one of said links.

The line-spacing pawl being normally out of engagement with its cooperating line-spacing ratchet-wheel, either of the finger-wheels
35 may at any time be employed to rotate the platen in either direction, and the platen will be retained in the position to which it may be moved by the detent 98^a and its cooperating detent-wheel.

40 Various changes may be made without departing from the spirit of my invention and certain features may be employed without the others.

Various features shown are not claimed
45 herein, but are claimed in an application filed by me on the 21st day of April, 1902, Serial No. 103,898.

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

50 1. In a type-writing machine, the combination of a carriage, a platen, means carried by the frame of the machine for returning the carriage to the right, and means independent of the returning means and effective
55 at any position of the carriage for automatically effecting a line-spacing movement of the platen during the initial portion of the return movement of the carriage.

2. In a type-writing machine, the combination of a carriage, a platen, means for re-
60 turning the carriage to the right, and means independent of the returning means and effective at any position of the carriage for automatically effecting a line-spacing movement
65 of the platen during the initial portion of the

return movement of the carriage, whereby a line-spacing movement of the platen may be automatically effected without making a complete return movement of the carriage.

3. In a type-writing machine, the combination of a platen, a carriage, line-spacing
70 mechanism that is carried in part by the frame of the machine and in part by the carriage and which is automatically actuated by and at the initial portion of the return
75 movement of the carriage irrespective of the position of the carriage, and a hand-actuated lever carried by the frame of the machine for returning the carriage.

4. In a type-writing machine, the combination of a carriage, a platen, a hand-lever
80 carried by the frame of the machine and extending adjacent to the keyboard for effecting a return of the carriage to the right, and line-spacing mechanism that is carried in
85 part by the frame of the machine and in part by the carriage and which is actuated automatically at the initial portion of the return movement of the carriage irrespective of the
90 position of the carriage.

5. In a type-writing machine, the combination of a platen, a carriage-returning
95 means for effecting a return of the carriage to the right, and line-spacing mechanism that is carried in part by the frame of the machine and in part by the carriage and which is actuated automatically and independently of
100 the returning means by the return movement of the carriage and at the initial portion thereof and irrespective of the position of
105 the carriage, whereby a line-spacing movement of the platen may be automatically effected independent of the returning means and without making complete return movement of the carriage.

6. In a type-writing machine, the combination of a carriage, a platen, line-spacing
110 mechanism carried in part by the carriage and in part by the frame of the machine and which is automatically moved to one position during the travel of the carriage in the
115 direction of its feed and which is automatically moved to another position during the travel of the carriage in an opposite direction to permit the carriage to move in one
120 direction without line-spacing and to automatically start to effect a line-spacing movement of the line-spacing mechanism the instant the carriage moves in an opposite direction and irrespective of the position of the carriage.

7. In a type-writing machine, the combination of a carriage, a platen, line-spacing
125 devices therefor, a lever carried by the carriage and adapted to automatically actuate the line-spacing device, and means carried by a fixed portion of the machine and with
130 which the lever is adapted at all times to cooperate during the travel of the carriage and at any point in the travel of the carriage

to automatically effect a line-spacing movement of the platen.

8. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, an actuating device carried by the carriage and adapted to automatically actuate the line-spacing devices, and a rack carried by a fixed portion of the machine and with which the actuating device maintains contact during the travel of the carriage in the direction of its feed and with which the actuating device automatically coöperates when the carriage is moved in an opposite direction to automatically effect a line-spacing movement of the platen.

9. In a type-writing machine, the combination of a carriage, a platen, line-spacing mechanism, and actuating means for said line-spacing mechanism, said actuating means being automatically actuated by the carriage and at the initial portion of the return movement thereof, regardless of the position of the carriage at the time such return movement begins.

10. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a lever pivoted to the carriage and operatively connected to the line-spacing devices, a pawl pivoted to said lever, and a rack carried by a fixed portion of the machine and with which the pawl is adapted to automatically coöperate during a travel of the carriage to effect a line-spacing movement of the spacing devices.

11. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a spring-pressed lever pivoted to the carriage and operatively connected to the line-spacing devices, a spring-pressed pawl pivoted to said lever, a rack that extends longitudinally of the carriage and is carried by a fixed portion of the machine and with which the pawl is adapted to automatically coöperate during the initial portion of the travel of the carriage to effect a movement of the line-spacing devices.

12. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a controlling-pawl for said line-spacing devices, a rack which coöperates with said pawl and permits a relative movement thereof in either direction, the movement of the controlling-pawl in one direction being ineffective to afford a line-spacing movement of the spacing devices, whereas a movement of the controlling-pawl in an opposite direction affords a line-spacing movement of said devices.

13. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices, a lever, a pawl carried thereby and movable independently thereof for a limited extent and a rack which coöperates with said pawl to automatically actuate the lever when the carriage is moved in one direction, to ef-

fect a line-spacing movement of the spacing devices.

14. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a lever for actuating said line-spacing devices, a pawl that coöperates with said lever to afford an automatic shifting thereof, and a rack with which said pawl contacts throughout the travel of the carriage in either direction.

15. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a lever for actuating said line-spacing devices, a pawl that travels with the carriage and coöperates with said lever to afford an automatic shifting thereof, and a fixed rack which affords a movement of the pawl over the teeth of the rack in either direction but actuates the lever when the carriage is moved in one direction to afford a line-spacing movement of the spacing device, and permits the lever to be restored to its normal position when the carriage is moving in an opposite direction.

16. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a lever operatively connected to said line-spacing devices, a pawl that is pivoted to said lever, a rack with which said pawl coöperates, there being a movement of the pawl over the teeth of the rack in both directions, the pawl maintaining one position relative to the lever when the carriage moves in one direction and another position relative to the lever when the carriage is moved in an opposite direction.

17. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, a lever operatively connected to said line-spacing devices, a spring-pressed pawl that is pivoted to said lever and has a limited movement relative thereto, and a rack with which said pawl coöperates, there being a movement of the pawl over the teeth of the rack in both directions, the pawl maintaining one position relative to the lever when the carriage moves in one direction and another position relative to the lever when the carriage is moved in an opposite direction, whereby when the carriage moves in the direction of its feed the lever will be moved to its initial position and when the carriage is moved in an opposite direction the lever will be automatically shifted to effect a line-spacing movement of the spacing devices.

18. In a type-writing machine, the combination of a carriage, a platen, and automatically-actuated line-spacing mechanism including a rack and a coöperating controlling-pawl provided with a teat that coöperates with the teeth of the rack and having a shoe that slides over said teeth.

19. In a type-writing machine, the combination of a carriage, a platen, automatically-actuated line-spacing mechanism including

a rack and a cooperating controlling-pawl provided with a teat that cooperates with the teeth of the rack and having a shoe that slides over said teeth and means for automatically affording a movement of the teat into contact with the teeth of the rack when the carriage moves in one direction and for automatically affording a movement of the teat out of contact with teeth of the rack and a movement of the shoe into contact therewith when the carriage is moved in an opposite direction.

20. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices for said platen, a rack, a cooperating controlling-pawl provided with a teat that is adapted to cooperate with the teeth of the rack and having a shoe that slides over said teeth, and intermediate connections between said line-spacing devices and said controlling-pawl.

21. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices for said platen, a rack, a cooperating controlling-pawl provided with a teat that is adapted to cooperate with the teeth of the rack and having a shoe that slides over said teeth, intermediate connections between said line-spacing devices and said controlling-pawl, and means for automatically affording a movement of the teat into contact with the teeth of the rack when the carriage moves in one direction and for automatically affording a movement of the teat out of contact with teeth of the rack and a movement of the shoe into contact therewith when the carriage is moved in an opposite direction.

22. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices for said platen, a rack, a cooperating controlling-pawl provided with a teat that is adapted to cooperate with the teeth of the rack and having a shoe that slides over said teeth, and a lever which is connected to said controlling-pawl and is operatively connected to the line-spacing devices, whereby a relative movement between the pawl and rack in one direction may be effected without affording a line-spacing movement and a relative movement between the pawl and rack in an opposite direction will effect a line-spacing movement of the platen.

23. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices for said platen, a rack carried by the frame of the machine and extending from side to side thereof, a cooperating controlling-pawl carried by the carriage and provided with a teat that is adapted to cooperate with the teeth of the rack during the movement of the carriage from side to side of the machine, and a shoe on said pawl that slides over said rack-teeth, and intermediate connections

between said line-spacing devices and said controlling-pawl.

24. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices for said platen, a rack, a cooperating controlling-pawl provided with a teat that is adapted to cooperate with the teeth of the rack and having a shoe that slides over said teeth, and a lever which is pivoted to the carriage and is connected to said controlling-pawl and is operatively connected to the line-spacing devices, whereby a movement of the carriage in one direction may be effected without affording a line-spacing movement and a movement of the carriage in an opposite direction will effect a line-spacing movement of the platen.

25. In a type-writing machine, the combination of a carriage, a platen carried thereby, line-spacing devices for said platen, a rack, a cooperating controlling-pawl provided with a teat that is adapted to cooperate with the teeth of the rack, a shoe on said pawl that is adapted to bear against and slide over said teeth, a spring-pressed lever to which said pawl is pivoted, a spring which tends to maintain a given relation between the pawl and lever, and operative connections between the lever and said line-spacing devices.

26. In a type-writing machine, the combination of a carriage, a platen carried thereby, line-spacing devices for said platen, a rack carried by a fixed portion of the machine and which extends longitudinally of the run of the carriage, a cooperating controlling-pawl carried by the carriage and provided with a teat that is adapted to cooperate with the teeth of the rack when the carriage moves in one direction, and a shoe on said pawl that is adapted to bear against and slide over said teeth, a spring-pressed lever to which said pawl is pivoted, a spring which tends to maintain a given relation between the pawl and lever, and operative connections between the lever and said line-spacing devices, whereby the movement of the carriage in one direction is effective to automatically line-space and a movement of the carriage in an opposite direction may be effected without automatically line-spacing.

27. In a type-writing machine, the combination of a carriage, a platen, a line-spacing ratchet-wheel, a line-spacing pawl cooperating therewith, a lever connected to said pawl, a controlling-pawl carried by said lever, and a rack with which said controlling-pawl cooperates during the travel of the carriage to automatically actuate the line-spacing pawl when the carriage is moved in one direction and to afford a movement of the carriage in the opposite direction without line-spacing.

28. In a type-writing machine, the combination of a carriage, a platen, a line-spacing ratchet-wheel, a line-spacing pawl cooperating

ing therewith, a spring-pressed lever connected to said pawl, a spring-pressed controlling-pawl carried by said lever, and a rack with which said controlling-pawl coöperates during the travel of the carriage, to automatically afford a movement of the lever to actuate the line-spacing pawl when the carriage is moved in one direction and to afford a movement of the line-spacing pawl back to its initial position when the carriage moves in the opposite direction.

29. In a type-writing machine, the combination of a platen, a line-spacing ratchet-wheel, a pawl therefor, automatically-operated means for actuating said pawl, and a friction device for effecting an engagement of the pawl with the ratchet-wheel during the initial portion of the line-spacing movement of said pawl.

30. In a type-writing machine, the combination of a carriage, a platen, line-spacing devices therefor, means for automatically actuating said line-spacing devices by a movement of the carriage from left to right and at the initial portion of said movement, and means for throwing said line-spacing devices out of operation, so that the carriage may be moved from left to right and the automatic line-spacing mechanism be ineffectual to line-space the platen.

31. In a type-writing machine, the combination of a carriage, a platen, carriage-releasing devices, line-spacing devices for the platen, means for automatically actuating said line-spacing devices at the initial portion of the return movement of the platen, and means controlled by said carriage-releasing devices for throwing said line-spacing devices out of operation.

32. In a type-writing machine, the combination of a carriage, a platen carried thereby, escapement devices for said carriage, hand-operated means for releasing the carriage from said escapement devices, line-spacing devices for the platen, means for automatically actuating the line-spacing devices when the carriage is moved from left to right and at the initial portion of said movement, and means controlled by said carriage-releasing means for rendering the line-spacing devices inoperative to effect a line-space movement of the platen.

33. In a type-writing machine, the combination of a carriage, a platen, carriage-releasing means, line-spacing devices for the platen, means for automatically actuating said line-spacing devices, which actuating means are carried in part by the carriage and in part by the frame of the machine and coöperate at any point in the travel of the carriage without an adjustment of the parts, and means controlled by said carriage-releasing means for throwing the line-spacing devices out of effective operation.

34. In a type-writing machine, the com-

bination of a carriage, a platen carried thereby, line-spacing mechanism, a handle for moving said carriage from left to right, and means independent of said handle for automatically actuating said line-spacing mechanism at the initial portion of the return movement of the carriage irrespective of the position of the carriage.

35. In a type-writing machine, the combination of a carriage, a platen carried thereby, carriage-feed mechanism, line-spacing mechanism, a handle carried by the frame of the machine and connected to said carriage-feed mechanism for moving the carriage from left to right, and means independent of said handle for automatically actuating said line-spacing mechanism at any point in the travel thereof.

36. In a type-writing machine, the combination of a carriage, escapement devices for said carriage, gear connections between the escapement devices and carriage, a handle connected to said gear connections and adapted to move the carriage through the gear connections from left to right, a platen carried by the carriage, line-spacing devices for the platen, and means for automatically actuating said line-spacing devices by a movement of the carriage.

37. In a type-writing machine, the combination of a carriage, escapement devices for said carriage, gear connections between the escapement devices and carriage, a handle connected to said gear connections and adapted to move the carriage through the gear connections from left to right, a platen carried by the carriage, line-spacing devices for the platen, means for automatically actuating said line-spacing devices, carriage-releasing mechanism, and means controlled by said carriage-releasing mechanism for rendering the line-spacing devices ineffective to turn the platen.

38. In a type-writing machine, the combination of a platen, a line-spacing wheel therefor, a movable carrier, a line-spacing pawl carried by said carrier and movable relatively thereto, means for actuating said pawl, and a friction device coöperating with said carrier and a relatively fixed part, whereby the pawl is first turned independently of the carrier to engage the line-spacing wheel.

39. In a type-writing machine, the combination of a platen, a line-spacing wheel therefor, a movable carrier, a line-spacing pawl carried by said carrier and movable relatively thereto, a friction device coöperating with said carrier and a relatively fixed part and automatically-actuated means connected to said pawl for moving the pawl and carrier, whereby the pawl will first be moved into or out of engagement with the ratchet-wheel and the pawl and carrier will then be moved together.

40. In a type-writing machine, the combination of a platen, a line-spacing wheel therefor, a movable carrier, a line-spacing pawl pivoted to said carrier, a stop which
5 limits the movement of the pawl relative to its carrier, a friction-spring cooperating with said carrier and a relatively fixed part, whereby the pawl will first be moved into or out of engagement with the ratchet-wheel
10 and the pawl and carrier will then be moved together.

41. In a type-writing machine, the combination of a carriage, a platen, a line-spacing ratchet-wheel therefor, a movable carrier, a
15 line-spacing pawl carried by said carrier and movable for a limited distance relative thereto, a friction device cooperating with the carrier and a relatively fixed part, and a lever which is connected to the line-spacing pawl
20 and is automatically moved in opposite directions by the travel of the carriage, whereby the line-spacing pawl will first be thrown into or out of engagement with the line-spacing ratchet-wheel and will then be
25 moved with its carrier to effect a line-spacing movement of the ratchet-wheel or to restore the pawl to its initial position.

42. In a type-writing machine, the combination of a carriage, a platen, a line-spacing ratchet-wheel therefor, a movable carrier, a
30 line-spacing pawl carried by said carrier and movable for a limited distance relative thereto, a friction device cooperating with the carrier and a relatively fixed part, a lever which is connected to the line-spacing pawl,
35 a controlling-pawl carried by said lever, and a rack with which the controlling-pawl cooperates throughout the travel of the carriage.

43. In a type-writing machine, the combination of a revolving platen, that is shiftable
40 to change the case position thereof, and constantly-intermeshing toothed gearing cooperating with the platen for affording a line-spacing thereof.

44. In a type-writing machine, the combination of a carriage, a platen that is shiftable
45 relatively to said carriage, a line-spacing gear on the carriage, and intermediate gearing between said line-spacing gear and the platen.
50

45. In a type-writing machine, the combination of a platen, links on which said platen
55 is adapted to swing, line-spacing devices, and means carried directly by one of said links for transmitting movement from said line-spacing devices to said platen.

46. In a type-writing machine, the combination of a platen, links on which said platen
60 is adapted to swing, line-spacing devices, and a transmitting toothed gear carried by one of said links and transmitting line-spacing movement from the line-spacing devices to the platen.

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

nation of a platen, links on which said platen
65 is adapted to swing, a gear that turns on the center on which said links swing, and geared connection between said gear and the platen to afford a line-spacing of the platen irrespec-
70 tive of the position to which the platen may be swung.

48. In a type-writing machine, the combination of a platen, links on which said platen
75 is adapted to swing, a driving-gear that turns on the center on which said links swing, a driven gear that is connected to the platen, and a transmitting-gear on one of said links and intermediate of the driving and driven gears and meshing therewith.

49. In a type-writing machine, the combination of a platen, links on which said platen
80 is adapted to swing, a driving-gear that turns on the center on which said links swing, a driven gear that is connected to the platen, a transmitting-gear on one of said links and intermediate of the driving and driven gears
85 and meshing therewith, a line-spacing ratchet-wheel operatively connected to said driving-gear, and a line-spacing device cooperating with said ratchet-wheel.
90

50. In a type-writing machine, the combination of a platen, links on which said platen
95 is adapted to swing, a driving-gear that turns on the center on which said links swing, a driven gear that is connected to the platen, a transmitting-gear on one of said links and intermediate of the driving and driven gears and meshing therewith, a line-spacing
100 ratchet-wheel operatively connected to said driving-gear, a line-spacing device cooperating with said ratchet-wheel, and means for automatically actuating said line-spacing device when the platen is moved to the right.

51. In a type-writing machine, the combination of a platen that is shiftable trans-
105 versely of its length, a gear that turns on the center around which the platen is shifted, intermediate operative connections between said gear and the platen, and line-spacing
110 devices for actuating said gear.

52. In a type-writing machine, the combination of a revoluble platen, that is shiftable
115 transversely of its length, a pinion that revolves with said platen, a gear that turns on the center around which the platen is shifted, an intermediate pinion between said gear and the first-mentioned pinion, and line-spacing
120 devices for actuating said gear.

53. In a type-writing machine, the combination of a carriage, a platen, automatically-
125 actuated line-spacing mechanism which is carried in part by the carriage and in part by the frame of the machine and is operable to automatically effect a line-spacing movement at the initial portion of the return movement
130 of the carriage irrespective of the position of the carriage, and adjustable means for affording different extents of line-space movement

to said line-spacing mechanism, whereby any one of several characters of line-spacing may be effected in accordance with the setting of said adjustable means.

5 54. The combination of a support, a hand-adjusted sliding plate 129 which is adapted to slide and be guided by said support, a spring-pressed ball interposed between said sliding plate and its support and adapted to
10 retain the plate in any one of several positions to which it may be moved, and depressions or indentures in which the ball is adapted to be seated.

15 55. The combination of a platen, links on which said platen is adapted to swing, gears on one of said links and a protecting-housing on the gear-carrying link which housing surrounds said gears.

20 56. In a type-writing machine, the combination of a carriage, a platen, and line-spacing mechanism comprising a member carried by the carriage and a member carried by the frame of the machine and which members automatically coöperate at the initial part
25 of the return movement of the carriage and irrespective of the position of the carriage,

to automatically effect a line-spacing movement of the platen.

57. In a type-writing machine, the combination of a carriage, a platen, means for re- 30 turning the carriage to the right, and means independent of the returning means and effective at any position of the carriage for automatically effecting a line-spacing movement of the platen during the return move- 35 ment of the carriage.

58. In a type-writing machine, the combination of a carriage, a platen, and a line-space mechanism operated by the return movement of the carriage and effective at any position of the carriage, said line-space mechanism comprising a part mounted on the carriage and a coöperating part mounted on the main frame. 40

Signed at Syracuse, in the county of Onondaga and State of New York, this 2d day of October, A. D. 1902. 45

ALEXANDER T. BROWN.

Witnesses:

CHARLES J. TONER,
F. G. BODELL.