Aug. 25, 1931. R. SEIDELINGER 1,820,329

TYPEWRITER

Filed Oct. 28, 1926 7 Sheets-Sheet 1

FIG. I.

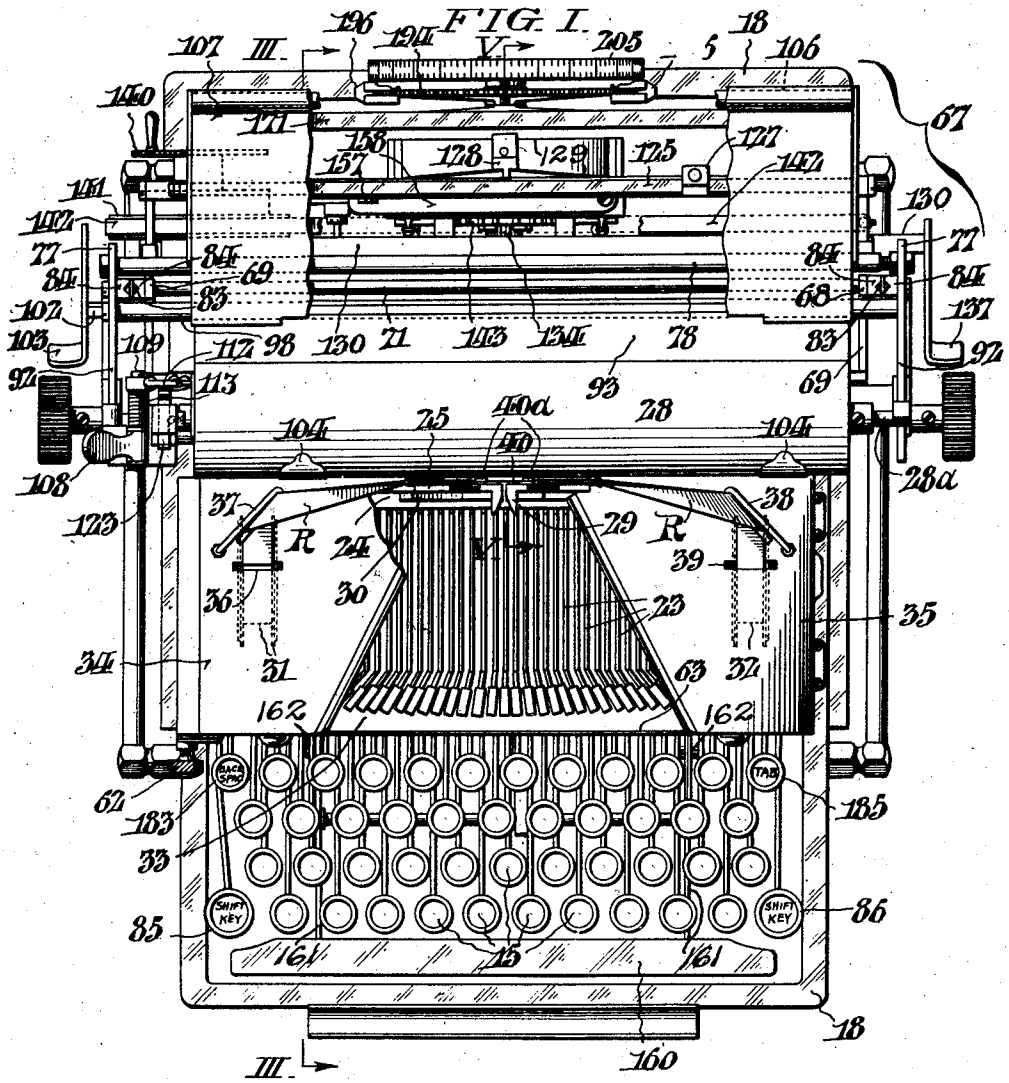
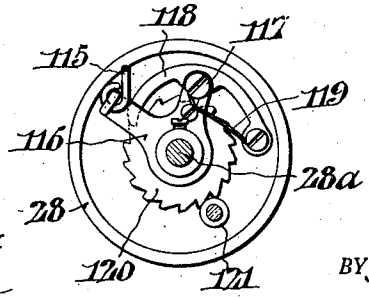


FIG. XIV.



WITNESSES

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TYPEWRITER

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FIG. XV

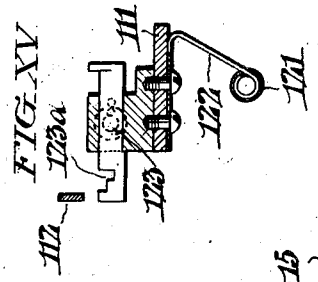


FIG. II.

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TYPEWRITER

Filed Oct. 28, 1926 7 Sheets-Sheet 3

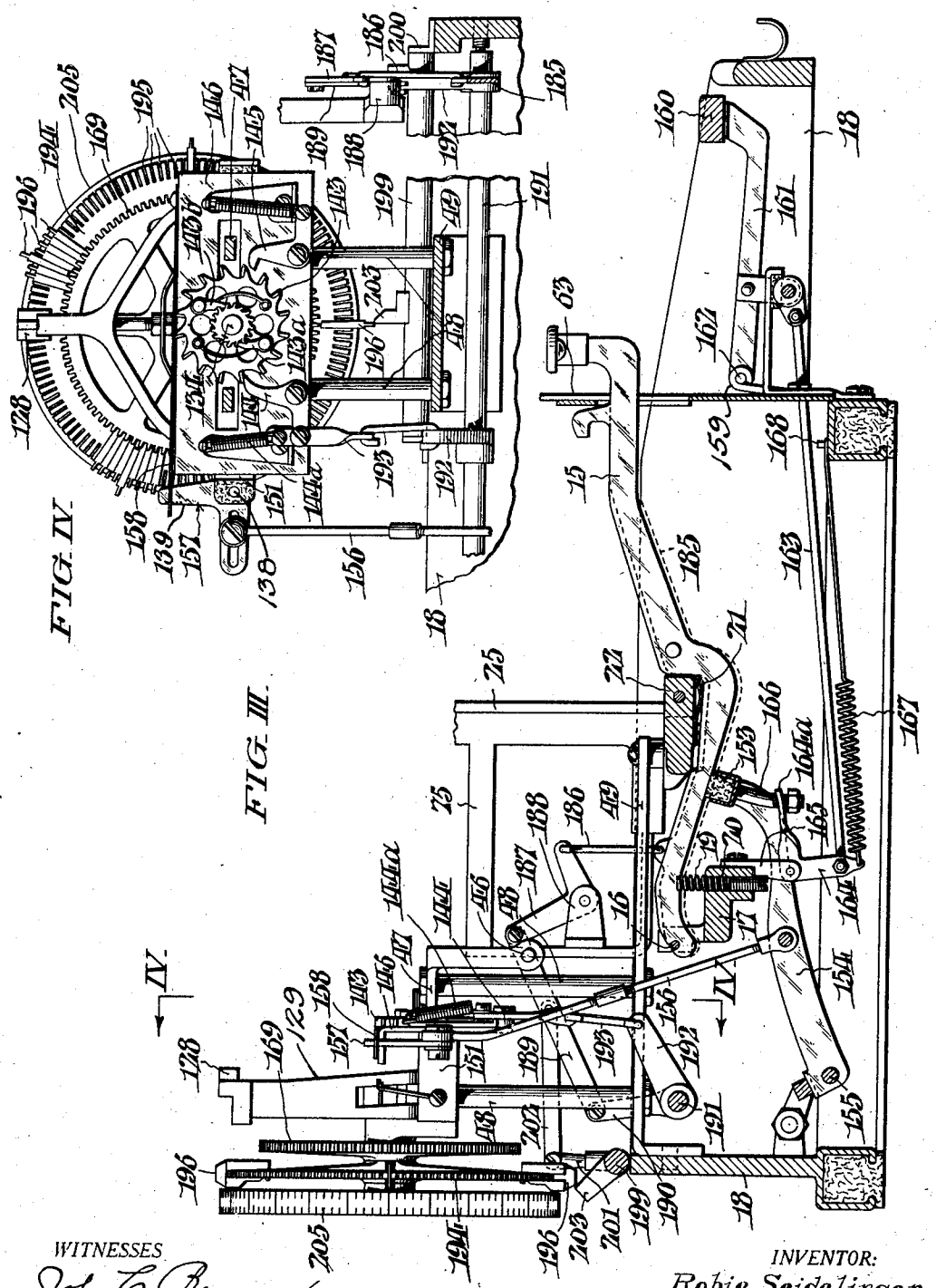


FIG. IV.

FIG. III.

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Aug. 25, 1931. R. SEIDELINGER 1,820,329

TYPEWRITER

Filed Oct. 28, 1926 7 Sheets-Sheet 4

FIG. V.

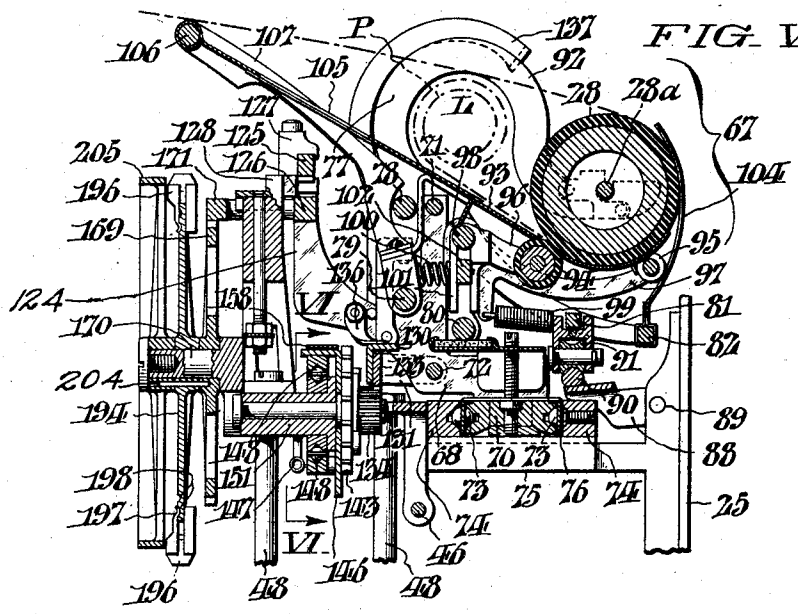


FIG. VI.

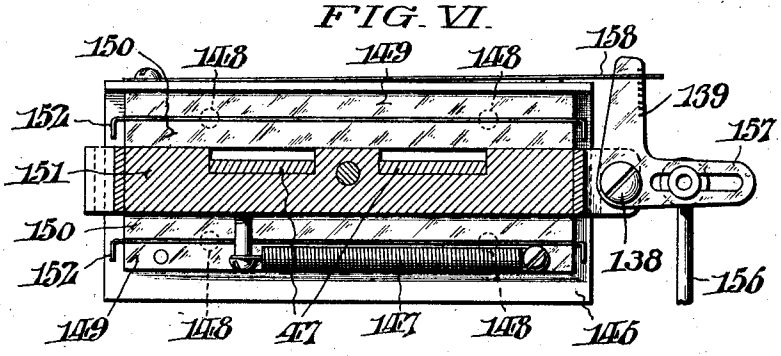
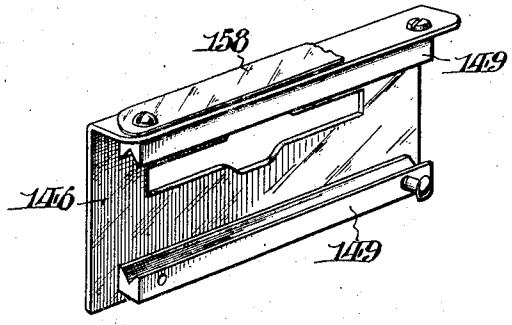


FIG. VII.



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Aug. 25, 1931. R. SEIDELINGER 1,820,329

TYPEWRITER

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FIG. VIII.

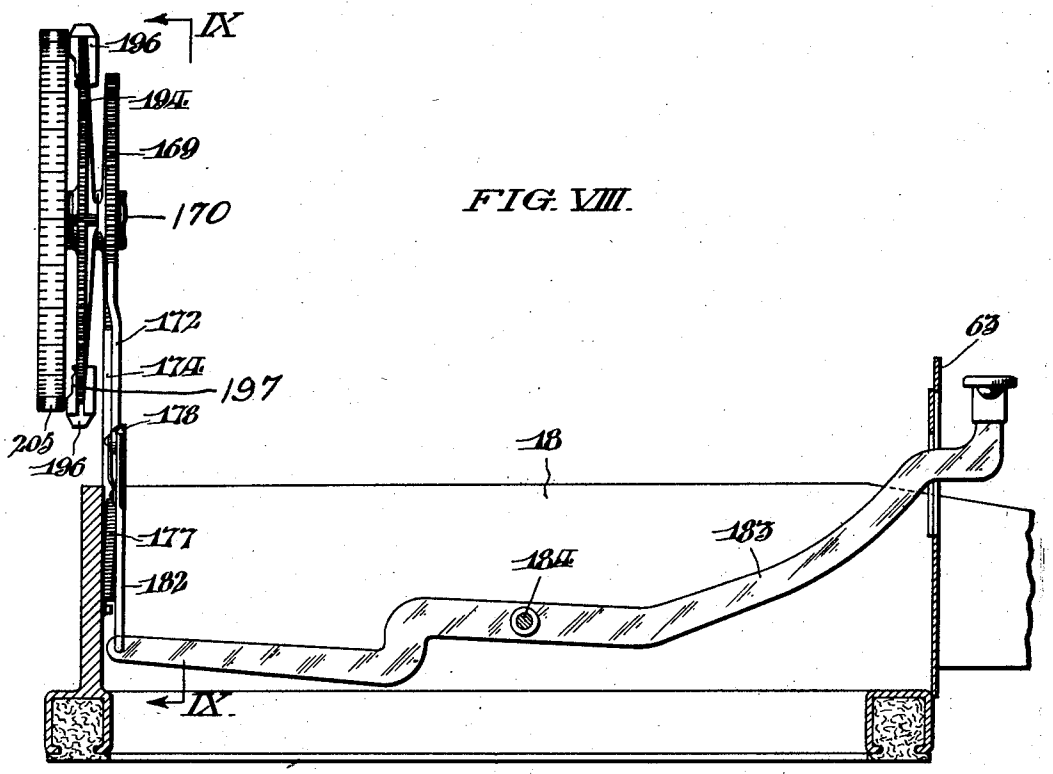
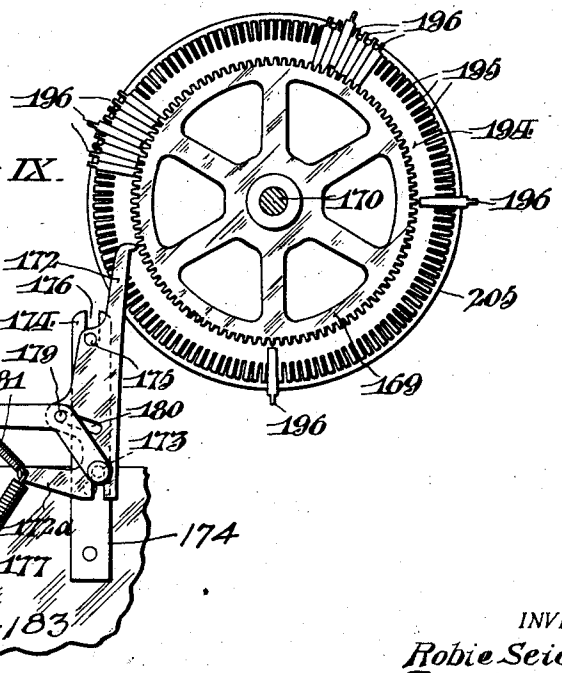


FIG. IX.



WITNESSES

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Aug. 25, 1931. R. SEIDELINGER 1,820,329

TYPEWRITER

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FIG. XI.

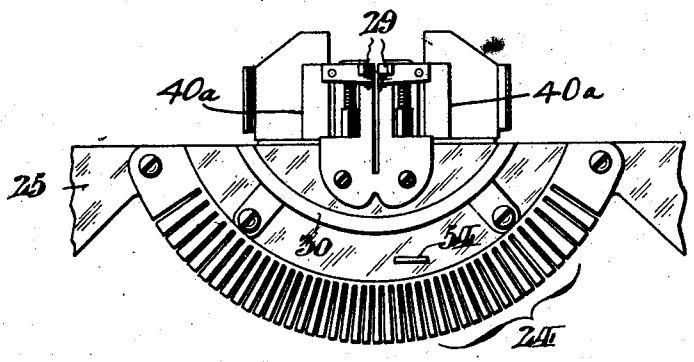
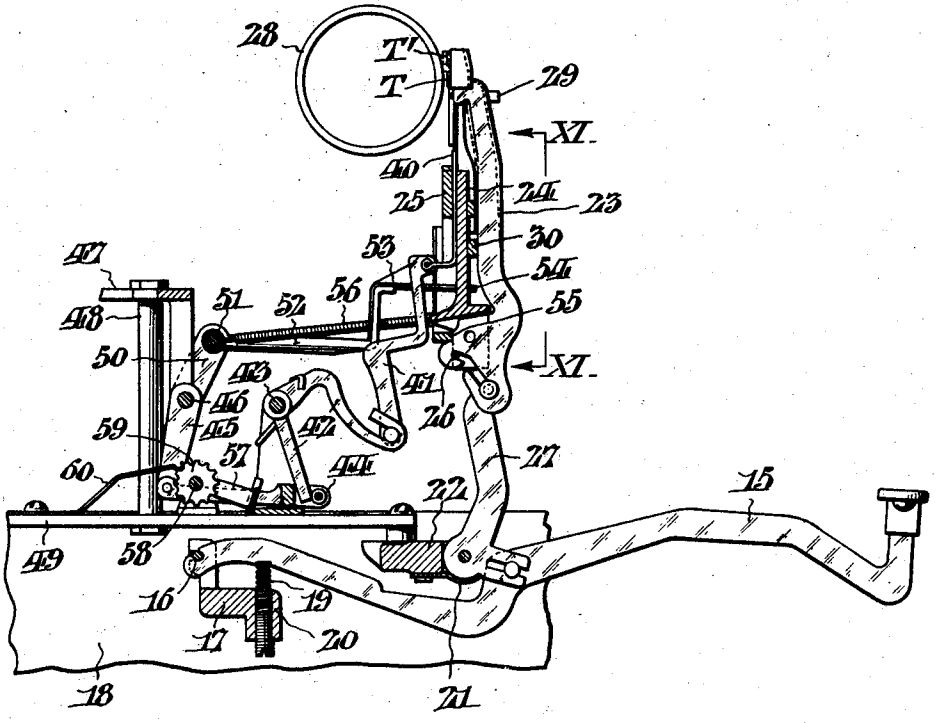


FIG. X.



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Aug. 25, 1931. R. SEIDELINGER 1,820,329

TYPEWRITER

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FIG. XII.

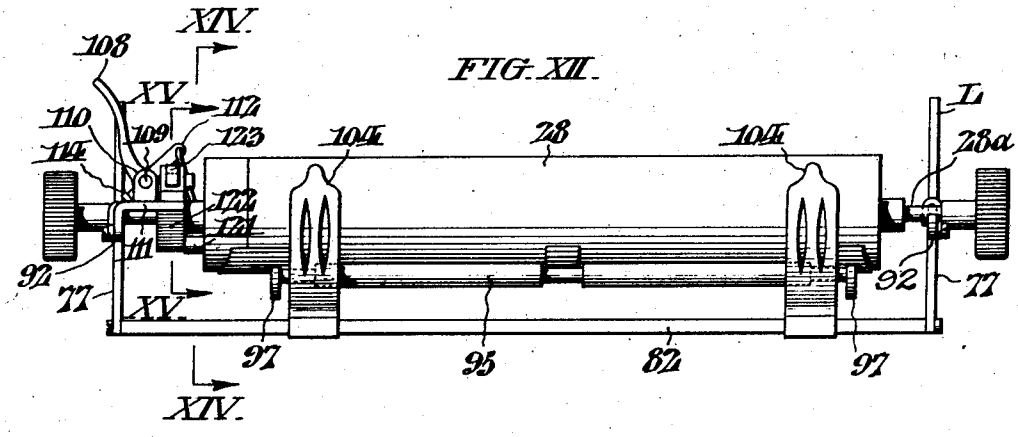
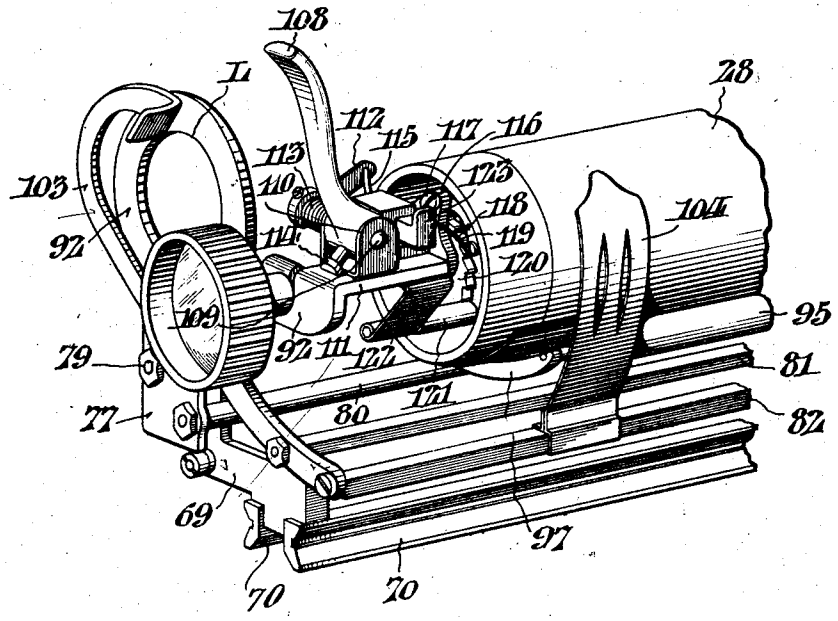


FIG. XIII.



WITNESSES

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Patented Aug. 25, 1931 1,820,329

UNITED STATES PATENT OFFICE

ROBIE SEIDELINGER, OF PHILADELPHIA, PENNSYLVANIA

TYPEWRITER

Application filed October 28, 1926. Serial No. 144,688.

This invention relates to typewriters, and more particularly to escapement mechanism therefor; the primary object being to prevent skipping of the platen carriage; while another object is to provide simple and reliable means whereby the foregoing desiderata may be conveniently secured.

In the drawings herewith Fig. I is a plan view of a typewriter conveniently embodying my invention.

Fig. II is an end elevation of the machine, as viewed from the left of Fig. I, with certain portions broken away to expose interior details.

Fig. III is a part cross section of the organization taken as indicated by the arrows III—III in Fig. I.

Fig. IV is a local section taken as designated by the arrows IV—IV in Fig. III.

Fig. V is a fragmentary cross section, taken as indicated by the arrows V—V in Fig. I, through the platen carriage and certain parts associated with the escapement mechanism for said carriage.

Fig. VI is a local section view taken as indicated by the arrows VI—VI in Fig. V.

Fig. VII is a perspective view of one of the parts shown in Fig. VI.

Fig. VIII is a skeletonized cross section of the machine showing the means governing back spacing of the platen carriage.

Fig. IX is a section taken locally as indicated by the arrows IX—IX in Fig. VIII.

Fig. X is a part cross section of the machine showing the action of the type levers.

Fig. XI is a front view of the sector plate on which the type levers are fulcrumed, as viewed in the direction of the arrows XI—XI on Fig. X.

Fig. XII is a front view of the vertically movable section of the platen carriage.

Fig. XIII is a perspective view of one end of the platen carriage showing the means for intermittently rotating the platen roll; and,

Figs. XIV, Sheet 1, and XV, Sheet 2, are detail sectional views taken as respectively indicated by the arrows XIV—XIV and XV—XV in Fig. XII.

In these illustrations the type keys 15 are shown as pivoted at their rear ends—Fig. III, for downward movement about a common fulcrum axis 16 fixed in a mounting bar 17 that extends longitudinally between opposite side rails of the rectangular machine frame 18. Such movement of the type keys 15 is yieldingly opposed by individually-associated springs 19 that engage within socket apertures 20 in the mounting bar 17 and tend to normally maintain said keys in the position of Fig. III against a flexible stop plate 21 secured along the bottom of a second longitudinal bar 22, of the machine frame 18, disposed somewhat to the fore of the bar 17 previously mentioned. The type bars, indicated at 23 in Fig. X, are arranged as a concaved series around and beneath the curved edge of a sector plate 24 secured centrally of a bridge piece 25 spanning the side rails of the machine frame at about the middle. This sector plate 24 is slotted radially as shown in Fig. XI, to receive and guide the inner ends of the type bars 23 which are pivoted for swinging movement on an arcuate rod 26 secured at the back of said plate. Swinging movement is imparted to the type bars 23 by the letter keys 15 through the medium of intermediary bell-crank levers 27 having pivotal support on the bar 22, see Fig. X. The radial arrangement of the type bars 23 determines striking of the type thereon at a single common point before the platen roll 28 where a clevised guide 29 is stationed to stabilize the bars against sidewise vibration at the instant of striking, said guide being secured centrally of the sector plate 24, as shown in Figs. I and XI. At the front, the sector plate 24 has a concentric arcuate ridge 30 which serves as an anvil to suddenly intercept the movement of the type bars 23 so that under the force of the blow, the free type carrying end of said bars is caused to flex forward momentarily thereby predetermining an instantaneous snap impression upon the sheet on the platen roll 28, followed by quick withdrawal of the type. This action is indicated in dotted lines in Fig. X, and, as will be readily understood, effectively prevents blurring of the typed impressions.

The ink ribbon R travels between winding

spools 31, 32 concealed in opposite ends of an enclosure 33 with retractable cover wings 34, 35, see Figs. I and II. In following the course of the ribbon R it will be seen that the same passes upwardly from the spool 31 through a slot 36 in the wing 34 to an angular guide 37 whereby it is redirected for passage across the front of the machine-edges up and down-before the platen roll 28. At the other side of the machine a second angular guide 38 functions to re-direct the ribbon R so as to pass downwardly through an opening 39 in the cover wing 35 enroute to the spool 32. Appropriate mechanism, only partly shown in Fig. II, is provided for intermittently rotating the spools 31, 32 automatically in order to feed the ribbon R step wise concurrently with progression of the platen carriage. This mechanism forms the subject matter of a co-pending application Serial Number 144,689, filed concurrently herewith, and need not therefore be further referred to herein.

To move the ribbon R up and down relative to the type striking point concurrently with the actuation of the type bars 23, I employ a vertically reciprocating carrier 40 having at opposite sides of an exposure interval, cheek pieces 40*a* Figs. I and XI with suitable transverse guide slots for traverse of the ribbon R. This carrier 40 is supported in a vertical slide bearing jointly provided by the sector plate 24 and the bridging bar 25, and at its lower end is coupled, by means of an angled link 41, with the one or bent arm of a bell-crank 42 fast on a shaft 43 journalled in upstanding bearings of the machine frame, see Fig. X. The other or straight arm of this bell-crank 42 is, in turn, coordinated by a link 44 with an arm 45 fast on a shaft 46 having journal bearing in depending lugs of a plate 47 which is sustained, by means of posts 48 at an elevation from a supporting bracket 49 extending forwardly from the rear rail of the machine frame 18. At opposite ends, the shaft 46 has arms 50 that are joined by a cross rod 51 having pivotal connection with rearward extensions 52 of a horizontal reciprocating member 53 which has a tongue 54 at its forward end engaging a guide slot in the sector plate 24, see Fig. XI. To the reciprocatory member 53 is secured a segmental tappet bar 55 which is concentric with the sector plate 24, and lies within the path of the type bars 23 so as to be struck by them to effect elevation of the ribbon R into position before the type reaches the platen roll 28. A coiled spring 56, in tension between the sector plate 24 and the cross rod 51, serves to normally hold the ribbon carrier 40 in the lowered position with previously typed impressions exposed to view as is common in so-called visible typewriters. In the position shown in Fig. X, only the upper margin of the ribbon R is exposed at the type striking point, but the throw of the carrier 40 may be increased so that the lower margin of the said ribbon may be presented when desired by means partly shown in Fig. X, such means including a forked lever 57 that engages the link 44, beyond the pivotal connection of the latter with the arm 45. The forked lever 57 is fast on a shaft 58 journalled in suitable bearings on the bracket 49, said shaft also carrying a notched disc 59 that cooperates with a spring detent 60 to normally hold the forked lever 57 in shifted positions. Thus, when the forked lever 57 is swung upward, it will be seen that the link 44 will be elevated along the straight arm of the bell-crank 42 with resultant impartation of greater throw to the carrier 40 than before. Manipulating means are provided for actuating the shaft 58 from the front of the machine, such means including a shaft 61, Fig. II with a finger knob 62 at its outer end, said shaft being rotatably supported by the frontal plate 63 of the machine, as well as by the bridging piece 25. At its inner end the shaft 61 has an arm 64 which is coupled by an interposed link 65 to an arm 66 at the contiguous end of the shaft 58 aforementioned. Accordingly, when a change in the throw of the ribbon carrier 40 is desired, this may be determined simply by rotating the finger knob 62 in one direction or the other.

The carriage for the platen roll 28, generally indicated by the numeral 67 Figs. I and V, is shiftable longitudinally of the machine and comprises an underframe with upright end members 68, 69 connected together by transverse bars 70, supplemental tie rods 71, 72 being also employed at other regions to lend further rigidity to the structure, see Figs. I, II, V. The underframe aforesaid is supported in an anti-friction slide bearing with balls 73 engaged in raceways jointly provided by the bars 70 and fixed flanking parallel bars 74 sustained by supports 75 that extend rearward from the bridging piece 25. A retainer comprising transversely joined perforated strips 76 serves to maintain the balls 73 definitely spaced. That section of the carriage 67 which directly supports the platen roll 28 is shiftable vertically relative to the under frame to position said platen roll 28 to take impressions either from the small or capital letter type T, T′ Fig. X on the type bars 23. The carriage section just referred to is constructed along lines generally similar to those of the under frame, i. e., it embodies end plates 77 which are tied together by a number of cross rods or tie rods 78, 79, 80, 81 and 82, see Figs. I, II, V and XIII. The office of guiding the platen roll carriage section for vertical shifting is relegated to anti-friction bearings whereof the balls 83 roll

between opposed raceways 84, 84 respectively secured on the parts 68, 69 and 77 see Fig. 1; and its movement is controlled by shift keys 85, 86 at opposite ends of the typewriter. These shift keys 85, 86 are coupled, with capacity for independent actuation, to the ends of arms 88 by means of two-part links 87. The arms 88 are fulcrumed at 89 to the rear of the bridge piece 25 and are united by a cylindric rod 90 extending longitudinally of the machine. This rod 90 serves as a track for a roller 91 journalled centrally of the tie bar 81 that connects the end plates 77 of the vertically shiftable carriage section. Thus, whenever one or the other of the shift keys 85, 86 is depressed, the platen roll supporting section will be lifted, for the purpose indicated, regardless of the position occupied by the platen carriage 67.

Now it will be observed from Figs. I, II, XII and XIII that the protruding extremities of the shaft 28*a* of the platen roll 28 are journaled in the ends of forwardly-projecting arms 92 integrally formed with the end plates 77 of the vertically-removable carriage section. As best shown in Figs. II, V, these arms 92 are bowed upward and outward toward their terminals with consequent provision of retaining loops L accessible from opposite ends of the carriage to take roll paper P conventionally indicated in dot-and-dash lines in Fig. V. Intermediate the retaining loops L, a guide plate 93 functions to direct the paper P between the platen roll 28 and auxiliary rollers 94, 95 that cooperate with it, said rollers being respectively supported at the ends by arms 96, 97 Figs. II and V fulcrumed for independent movement on a cross rod 98. Tension springs 99 drawing upon depending lugs of the arms 96, 97 act to maintain the roller 95 in contact with the platen roller 28; while the roller 94 is yieldingly urged upward by compression springs 100 influential upon depending extremities 101 of the arms 96. The extremities 101 just referred to are slotted to take a cross rod 102 which projects beyond the left hand end of the platen carriage 67, see Fig. I, where it is equipped with a manipulating member 103 whose configuration corresponds susbstantially to the curvature of the adjacent arm 92 so as to leave the paper roll retaining loop L at that end of the machine wholly unobstructed. After leaving the auxiliary roller 95, the paper P is directed upwardly and rearwardly about the platen roll 28 by flexible guide tongues 104 secured to the cross bar or tie rod 82, and is supported by an inclined plate 105. Along its upper edge, this plate 105 has pivotal connection with a tie rod 106 that joins rearwardly reaching supporting bracket arms 107 suitably secured to the vertically shiftable section of the platen carriage 67. By virtue of its pivoting, the supporting plate 105 may be lifted when access must be had to parts beneath.

Rotary shiftings of the platen roll 28 are effected through the medium of a finger lever 108 whereof the shaft 109 is fulcrumed in a bearing 110 secured on a lateral horizontal projection 111 of the arm 92, see Figs. XII and XIII. The shaft 109 protrudes beyond the bearing 110 at the inside to afford attachment for a lever 112 and to accommodate a surrounding torsion spring 113 operative in anti-clockwise direction, with respect to Fig XIII, to normally maintain the finger lever 108 in the illustrated position with a stop screw 114 thereon contacting with the horizontal projection 111 aforesaid of the arm 92. By means of a link 115, the lever 112 is coupled with one arm of a bell-crank 116 which is free on the shaft 28*a*, of the platen roll 28, and affords a pivot at 117 for a pawl 118 that is urged, by a spring 119 acting upon its tail, into engagement with the teeth of a ratchet-wheel 120 fast on said platen roll shaft. Rotative movement of the platen roll 28 is yieldingly opposed by a small roller 121 urged between the teeth of the ratchet 120 by a flexible supporting arm 122 fixed to the horizontal projection 111. Single, double and triple spacing is controllable by a shiftable stop 123 with steps 123*a* to cooperate with the lever 112, see Figs. I, XII, XIII and XV. It is to be particularly remarked that the ratchet wheel 120 and its pawl 118 occupy the hollow at the end of the platen roll 28, and that the associated actuating parts lie wholly within the circumference of said roll so that the paper P may project beyond the corresponding end of the latter. The opposite end of the platen roll 28, it will also be noted, is likewise entirely free of obstruction. Accordingly, paper of any width may be used in the machine.

As shown in Fig. V, the end members 68, 69 of the under frame of the carriage 67 have rearwardly and upwardly-projecting arms 124 with a pair of spaced parallel cross bars 125, 126 rigidly supported between them. The upper of these bars 125 is notched along its lower edge for convenience in setting marginal stops 127 in adjusted positions along its length. These marginal stops 127 engage a tappet 128, supported for rocking movement by a bracket 129, see Figs. I and III, in operating a caution signal—not shown—to apprise the operative of approach to the end of a typed line after usual practice in this art. Extending longitudinally of the machine at the rear of the under frame of the platen carriage 67 is a bar 130 of angular cross section with arms 131 extending forwardly

for pivotal connection on the rod 72 to the outside of the end members 68, 69, see Figs. II and V. To the bar 130 is secured a toothed rack 133 which is normally in meshing engagement with a gear pinion 134 associated with the escapement mechanism to be presently described. The illustrated position of the angle bar 130—Figs. II and V—is determined by stop pins 135 on the members 68, 69 against which the curved free ends 132 of the arms 131 are urged by a leaf spring 136 effective upon said bar. At the right hand end of the machine, the angle bar 130 has secured to it an actuating finger lever 137 through manipulation of which the rack 133 may be temporarily disengaged from the pinion 134 to permit shifting of the platen carriage 67 apart from control of the escapement mechanism. The finger lever 137 is curved to conform with the contiguous roll retaining loop L for a reason analogous to that described relative to the finger lever 103.

The platen roll carriage 67 is subject to the influence of a spring motor 140 of a conventional type located at the rear left hand corner of the machine frame. The spring barrel of this motor 140 is formed with a winding drum 141 to take in the tape 142, whereof the other end is hooked to the carriage 67. Draft of the carriage 67 toward the left by the just described means is under governance of the escapement mechanism, which—as shown in Figs. I, IV and V—comprises a ratchet wheel 143 wherewith are associated a pair of stop detents 144, 145. The first mentioned 144 of these detents acts as a full stop and the other 145 as a half stop incidental to each incremental movement of the ratchet 143 in determining the spacing of the typed impressions upon the paper P on the platen roll 28. The detents 144, 145 are mounted on a slide plate 146—Fig. VII—that is reciprocatable horizontally against the pull of a tension spring 147—Fig. VI—under guidance of bearings with balls 148 engaging opposing raceways 149, 150 respectively secured to said plate and a member 151 forming part of the superstructure supported by the bracket 49. In each instance but two balls 148 are employed, these being held in proper spaced relation by perforated retainer strips 152, see Fig. VI. The escapement means is actuated concurrently with the operation of the letter or type keys 15 by mechanism which includes a longitudinally-extending universal bar 153 that underlies said letter or type keys, and is supported from the ends of arms 154, with pivots on a fixed cross shaft 155. By means of an adjustable link 156, one of the arms 154 is coupled with a bell-crank lever 157 fulcrumed at 138 to the part 151, see Fig. IV. The upright arm of this bell crank lever 157 is notched or toothed at 139—Figs. IV and VI—to enable adjustment of its connection with the free end of a flexible strip 158 attached to the slide plate 146. Therefore when a letter key 15 is depressed, its motion is transmitted through the universal bar 153 and the coordinated elements just described, to the slide plate 146 with the result that the latter is drawn to the left—Fig. IV—to retract the detent 144 and, at the same time, to bring the companion detent 145 into action. The ratchet 143 is consequently permitted to rotate through a half step. With the return movement of the slide plate 146 to the right, the detent 144 is restored to activity concurrently with withdrawal of the detent 145, thereby to permit completion of incremental movement of the platen carriage 67 under pull of the spring motor 140. This arrangement, it will be seen, acts as a positive check on the platen carriage 67 so that skipping is absolutely prevented. Shifting of the platen carriage 67 is also subject to control by the spacing bar or key 160 whose rearwardly-extending arms 161 have pivotal connection by hinge leaf means 159 with the machine frame 18—see Figs. I and III—at 162. The movement of the spacing bar 160 is communicated, by means of links 163, to bell-crank levers 164 fulcrumed to bearings 165 depending from the mounting bar 17 hereinbefore referred to, the forked extremities 164*a* of the bell cranks 164 cooperating with the heads of studs 166 extending downwardly from the universal bar 153. Thus, by depression of the spacing bar 160 in opposition to a spring 167 in tension between a fixed anchorage 168 on the machine frame and the bell crank lever 164, it will be seen that movement is imparted to the universal bar 153 with incidental actuation of the escapement precisely as before. Shifting of the platen carriage 67, to the right, does not effect the escapement since at such times the detents 143*a*, 143*b* Fig. IV on the ratchet wheel 143 ride idly over the teeth of the pinion 134.

The means which I provide to enable back spacing comprises a toothed wheel 169 that is secured on a shaft 170 and meshes with a rack 171, on the back of the platen carriage 67. The toothed wheel 169 is adapted to be picked by a pawl 172—Figs. VIII and IX—whereof the lower end is slotted so as to engage a stud 173 projecting laterally from an upstanding post 174 secured to the rear wall or rail of the machine frame 18. Near the upper end, the pawl 172 carries a pin 175 that projects into an open ended vertical slot 176 at the top of the post 174, said slot being somewhat wider than the diameter of the pin. As a consequence of this construction, the pawl 172 is accorded capacity for vertical movement—as well as limited rocking movement—about the stud 173 by virtue

of the loose fit of the pin 175 within the post slot 176. A tension spring 177 acting upon a lateral arm 172*a* of the pawl 172 normally maintains the latter in the position shown in Fig. IX. An angled lever 178 fulcrumed on the stud 173 has a lateral pin 179 engaging a downwardly inclined transverse slot 180 in the body of the pawl 172. A tension spring 181 active upon the lever 178 is influential in holding the pawl 172 retracted, as shown in the illustration last referred to. The outer end of the angled lever 178 is coupled by a link 182 with the rear extremity of the back spacing key 183 which, as illustrated in Fig. VIII, is fulcrumed on a fixed center 184 and so located that it does not have any effect upon the universal bar 153. The action of the back spacing means is as follows: motion derived as a result of depression of the spacing key 183 is transmitted by the link 182 to the angled lever 178. Incidental to the movement of the latter, coaction as between the stud 179 and the slot 180 will first determine swinging of the pawl 172 to the right about the stud 173—as permitted by the clearance between the pin 175 and the guide slot 176—into engagement with the toothed wheel 169. Continued movement of the lever 178 is attended by elevation of the pawl 172 to impart clockwise rotation to the toothed wheel 169 with consequent shifting of the platen carriage 67 to the right, the stop detent 144 yielding to being moved about its pivot by the teeth of the escapement ratchet 143 in opposition to a spring 144*a*.

The tabulating mechanism with which this invention is in part concerned is controlled by a special key 185 that is pivoted on the same axis 16 with the letter or type keys 15 and located at the extreme right of the upper key row, as shown in Fig. I, beyond the corresponding end of the universal bar 153. In order to distinguish it from the others, I have shown the tabulator key 185 in dotted outline in Fig. III. Through a connecting link 186, movement of the key 185 is communicated to a bell-crank 187 pivotally supported by a fixed bracket 188 and, in turn, coordinated by a link 189, with an arm 190 fast on a longitudinal shaft 191. A second arm 192 on the shaft 191 has a link connection 193 with the full stop detent 144 that cooperates with the escapement ratchet 143, see Fig. IV. Consequently, when the tabulator key 185 is depressed, the stop detent 144 is retracted, thereby releasing the platen carriage 67 to the spring motor 140 for draft toward the left. In order to enable checking such movement of the platen carriage 67 in determining the starting point of a new line in tabulating, I equip the machine with means as follows: Fast on the axis 170 to the rear of the toothed wheel 169 is a rotor disk 194 with circumferential notches 195 for radial guidance of straddling stop lugs 196 which are characterized by spring tongues 197 with curled terminals, see Fig. V. These spring tongues 197 cooperate with spaced concentric grooves 198 in one side face of the disk 194 to hold the stop lugs 196 either in retracted idle, or extended active positions as shown in Fig. IV. A shaft 199 journalled in bearings 200—Fig. II—upstanding from the rear wall or rail of the machine frame 18, is adapted to be rocked clockwise with reference to Fig. III, concurrently with depression of the tabulator key 185. Accordingly it is provided with an arm 201 that is coupled by a connecting rod 202 with the link 189. Incidental to rocking of the shaft 199 as just explained, a stop finger 203 thereon is swung into position beneath the disk 194 so as to intercept any of the projected check or stop lugs 196. Therefore, by choice as between the stop lugs 196, the return movement of the platen carriage 67 may be arrested at any point within the limits of its traverse for the purpose of tabulation, simply by depressing the tabulator key 185. Setting of the stop lugs 196 is facilitated by an annular numbered scale 205 fast to the rotor disk 194 by a cotter pin 204—Fig. V, which is graduated to correspond with the circumferential notches of the latter, as well as with the incremental stop positions of the platen carriage 67.

Having thus described my invention, I claim:

1. In a typewriter embodying a platen carriage, and escapement mechanism therefor including an escapement wheel, a slide plate under guidance of ball bearings horizontally reciprocative in opposition to spring tension, individual full and half stop detents carried by said plate for alternate active engagement at opposite points of the escapement wheel, a universal bar with an operative connection to the slide plate including an adjustable link co-active with a notched bell-crank having a flexible connection to such slide plate, said bar being actuable by the letter keys of the typewriter to effect simultaneous horizontal movement of the slide plate in determining a two-stage shog incidental to each progressive movement of the platen carriage, and a special key with operative connection to the full stop detent whereby the latter may be independently retracted to free the platen carriage from escapement control.

2. In a typewriter embodying a platen carriage, and escapement mechanism therefor including an escapement wheel, a slide plate under guidance of ball bearings horizontally reciprocative in opposition to spring tension, individual full and half stop detents carried by said plate for alternate active engagement at opposite points of the escape-

ment wheel, a universal bar with an operative connection to the slide plate including an adjustable link co-active with a notched bell-crank having a flexible connection to such slide plate, said bar being actuable by the letter keys of the typewriter to effect simultaneous horizontal movement of the slide plate in determining a two-stage shog incidental to each progressive movement of the platen carriage, and a special tabulator key co-ordinated by a linkage with interposed bell cranks to the full stop detent whereby the latter may be independently retracted to free the platen carriage from escapement control.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 25th day of October, 1926.

ROBIE SEIDELINGER.