

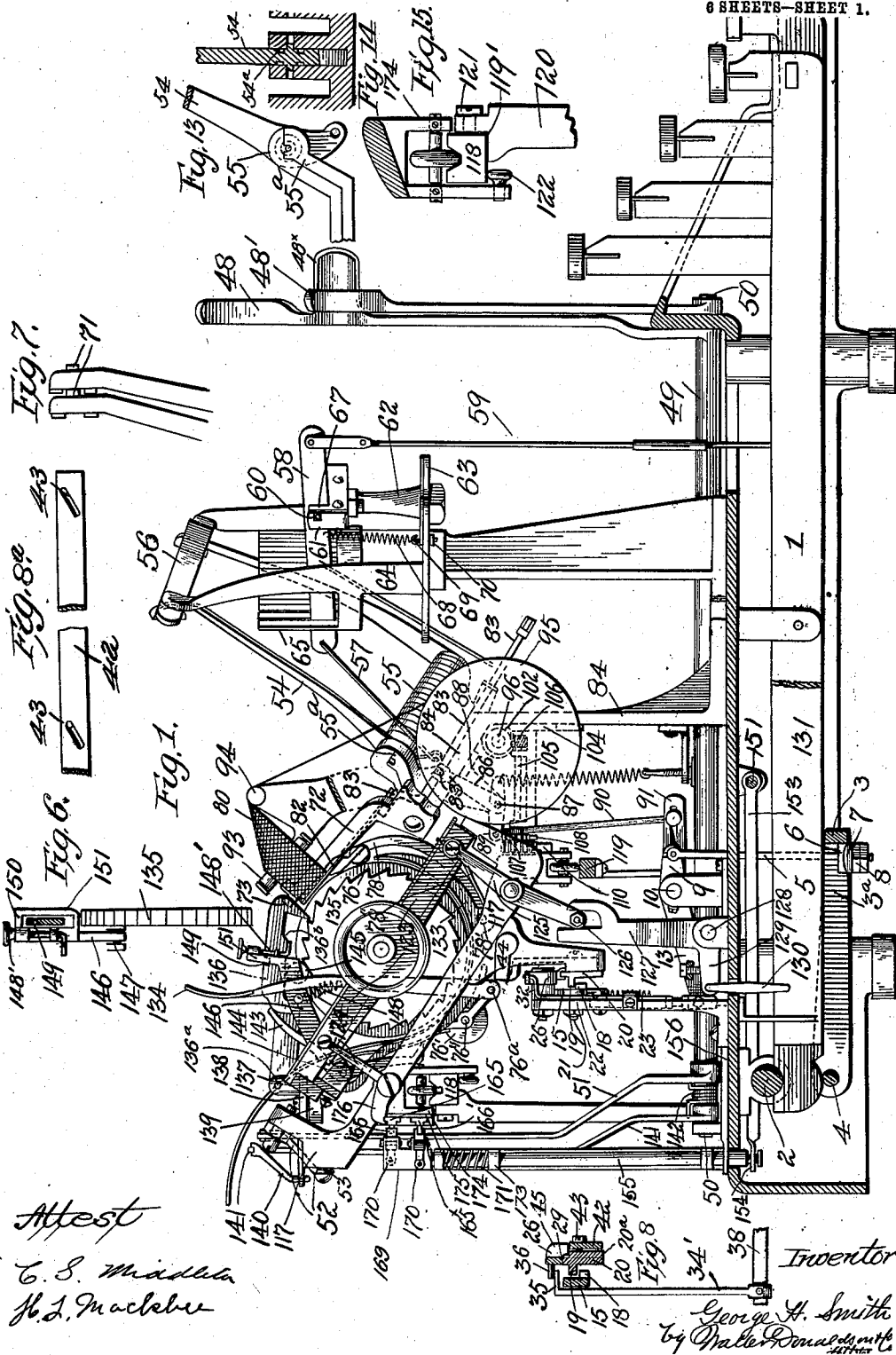
No. 858,356.

PATENTED JUNE 25, 1907.

G. H. SMITH.
TYPE WRITER.

APPLICATION FILED JULY 1, 1898.

6 SHEETS—SHEET 1.



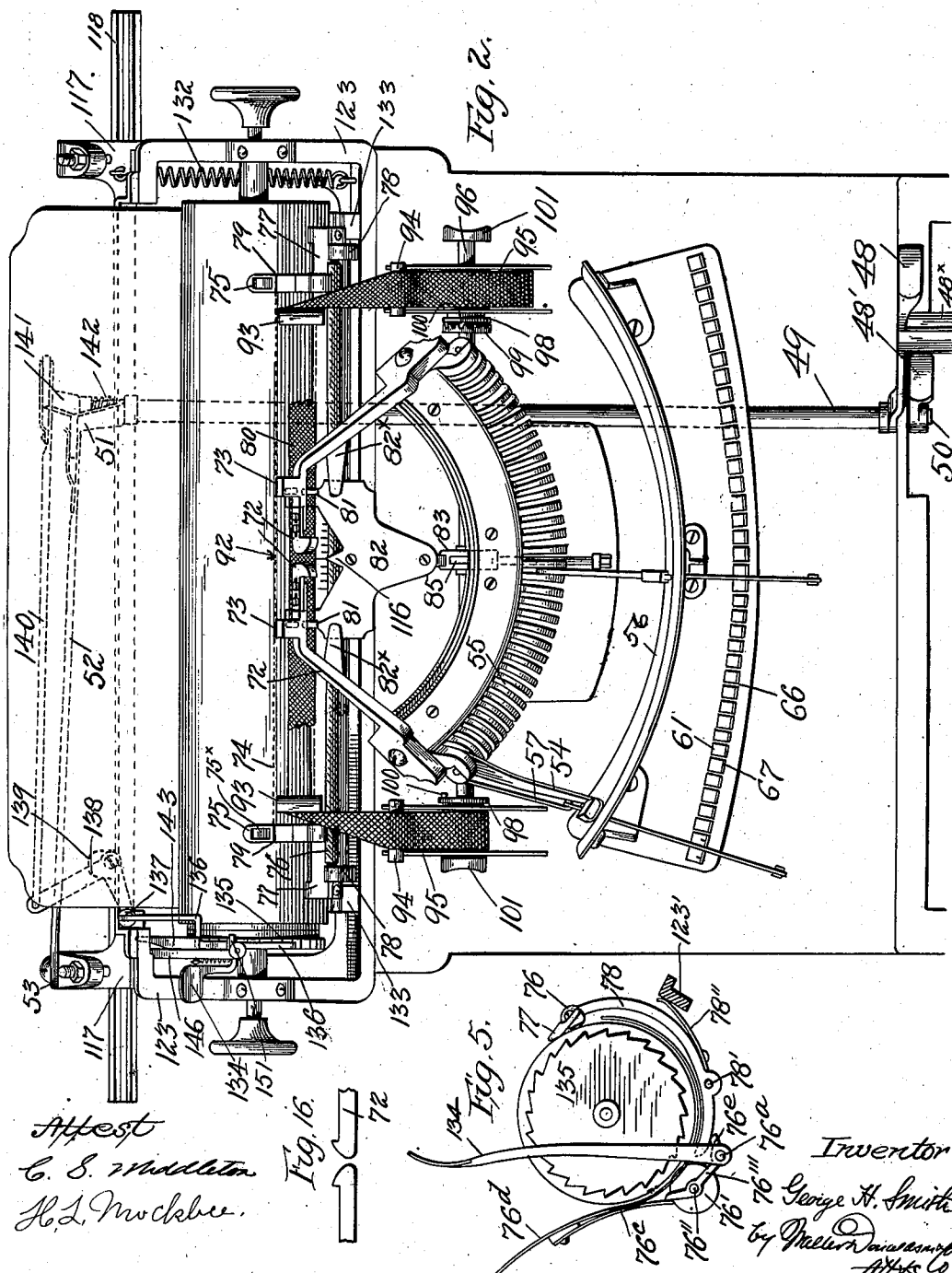
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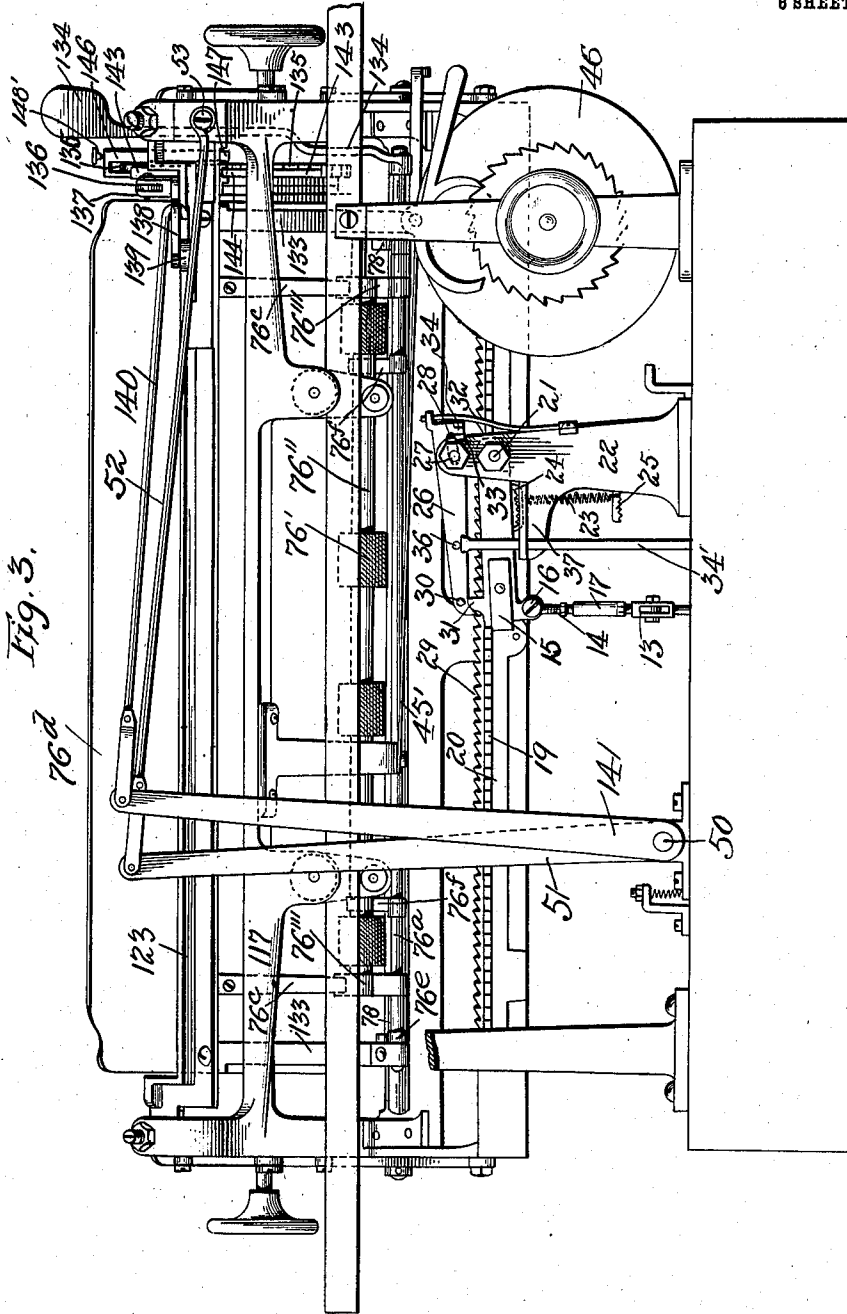
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6 SHEETS—SHEET 3.



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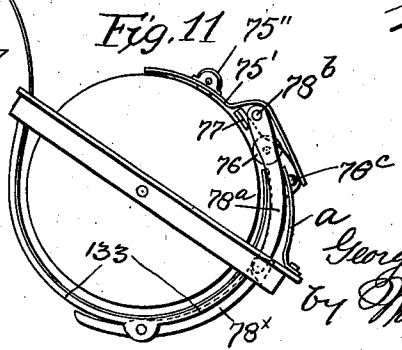
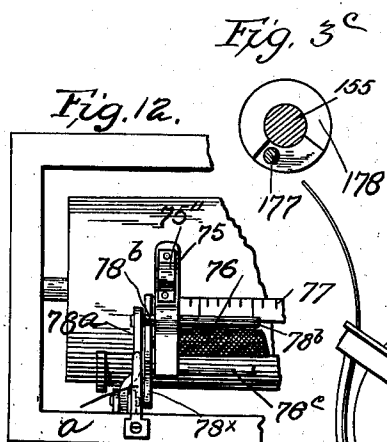
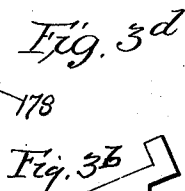
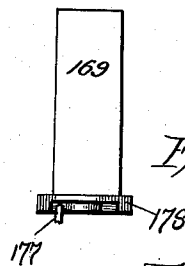
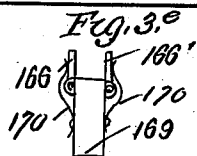
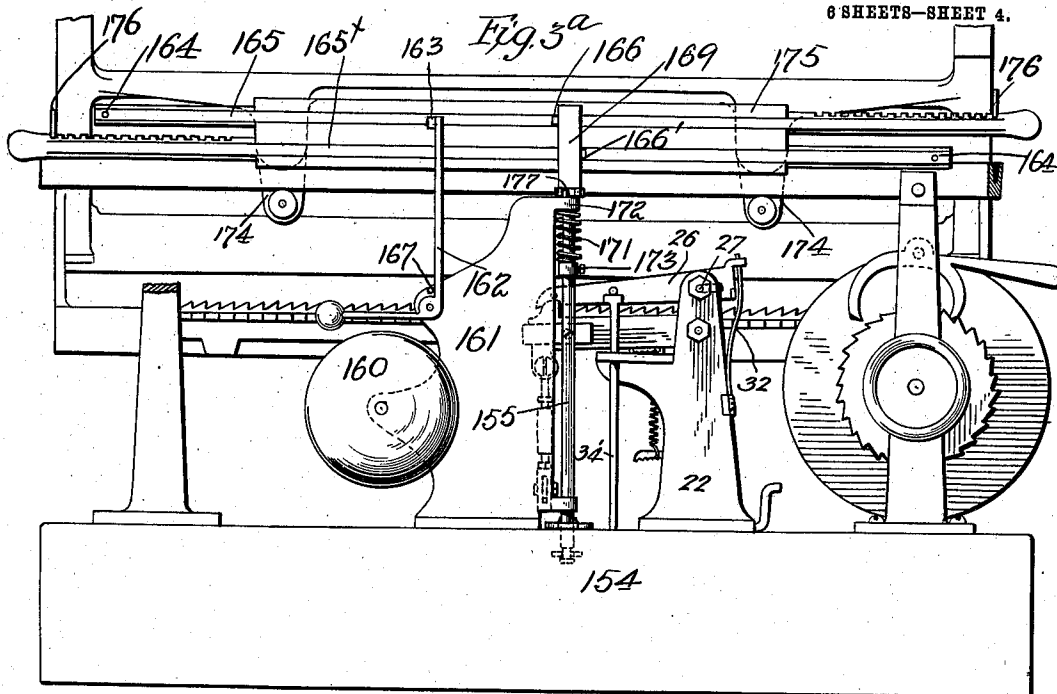
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6 SHEETS—SHEET 4.



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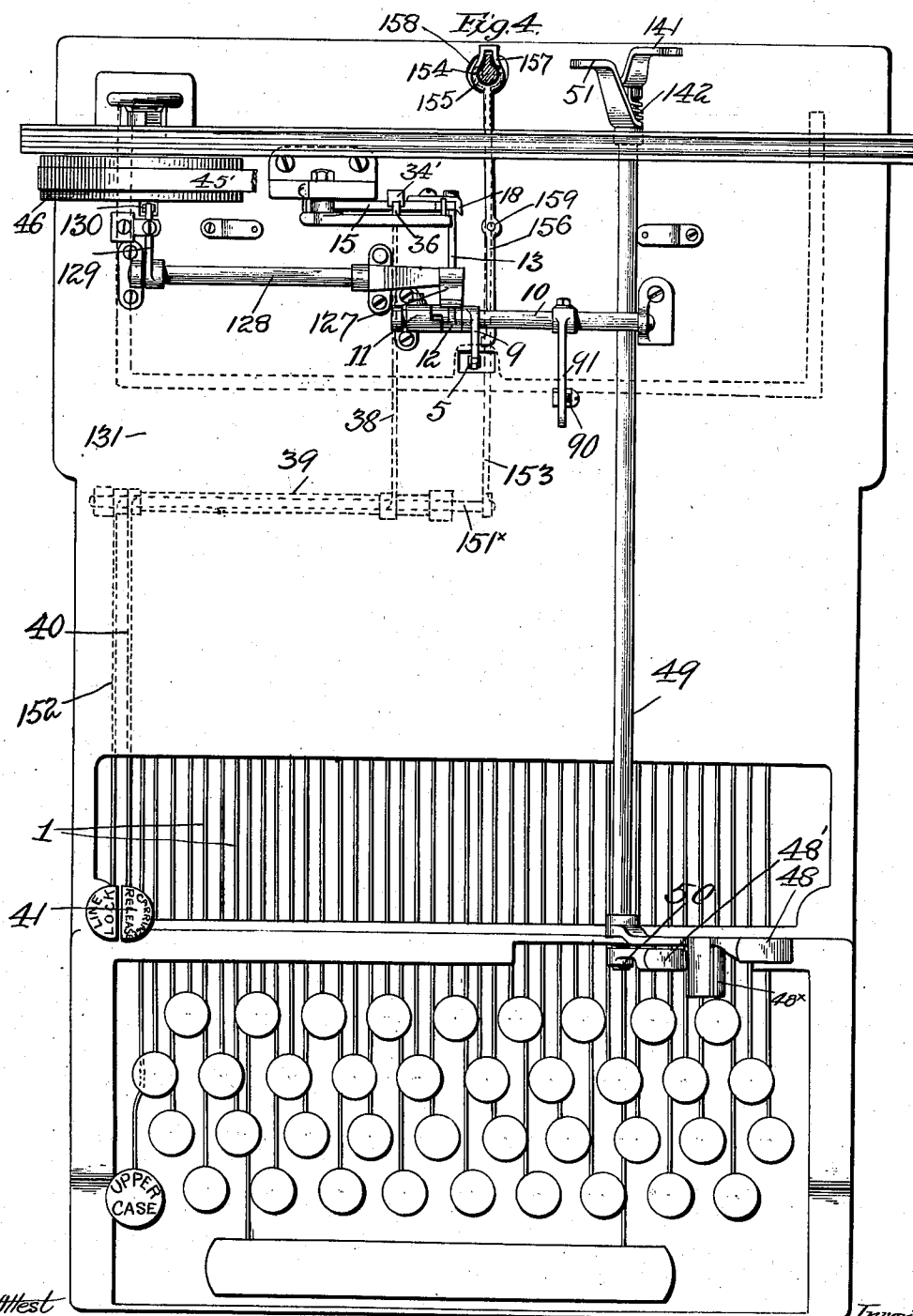
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6 SHEETS—SHEET 5.



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6 SHEETS—SHEET 6.

Fig. 9.

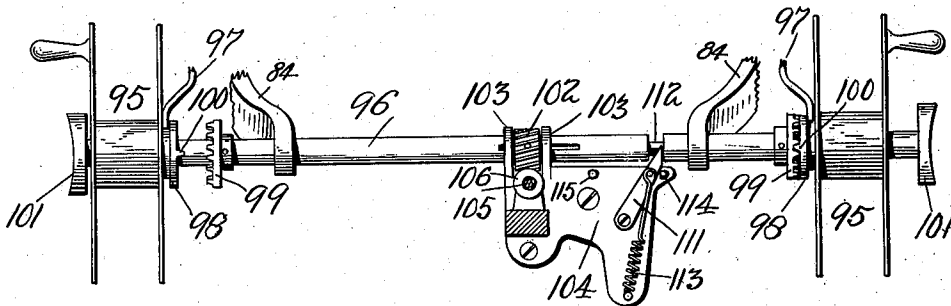
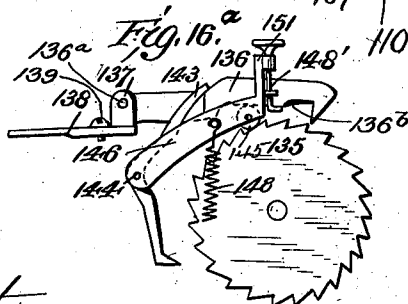
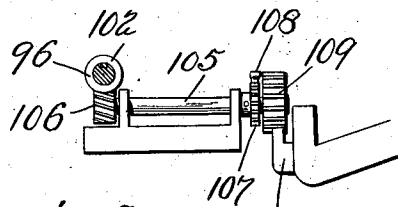


Fig. 10.



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UNITED STATES PATENT OFFICE.

GEORGE H. SMITH, OF CEDAR RAPIDS, IOWA, ASSIGNOR TO UNION TYPE-WRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITER.

No. 858,356.

Specification of Letters Patent.

Patented June 25, 1907.

Application filed July 1, 1898. Serial No. 684,991.

To all whom it may concern:

Be it known that I, GEORGE H. SMITH, a citizen of the United States, residing at Cedar Rapids, Linn county, Iowa, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

My invention relates to typewriting machines and more particularly to the form of typewriting machine described in my application for Letters Patent of the United States No. 640,951, filed June 16, 1897, and it is my object in the present invention to provide a simple and efficient typewriting machine and to simplify the construction of the previous machine and render its operation and manipulation more effective.

In the accompanying drawings:—Figure 1 is a side elevation of the machine with parts in section. Fig. 2 is a plan view of the machine with parts omitted. Fig. 3 is a rear view of the machine with parts omitted. Fig. 3^a is a similar view to Fig. 3 showing parts relating to the combined carriage release, line lock and marginal stop mechanism, these parts being omitted from Fig. 3 for convenience and clearness of illustration. Fig. 3^b is a detail fragmentary end view of a portion of the alarm mechanism. 3^c is a detail plan view of the line lock and margin stops. Figs. 3^c, 3^d are detail rear elevation and bottom views respectively of portions of the line lock and margin stop mechanism. Fig. 4 is a plan view of the machine with the carriage and other parts omitted. Fig. 5 is a detail end view of the platen and the paper feed mechanism with parts omitted. Fig. 6 is a detail front view of a portion of the line spacing mechanism. Fig. 7 is a fragmentary detail side view of some of the type bars. Fig. 8 is a detail transverse sectional view of the escapement mechanism. Fig. 8^a is a fragmentary detail face view of a portion of the carriage release. Fig. 9 is a detail plan view relating to the ribbon movement. Fig. 10 is a detail transverse sectional view of the same. Fig. 11 is a detail end view of a modified form of paper feed mechanism. Fig. 12 is a fragmentary plan view of the same. Figs. 13 and 14 are detail side and transverse sectional views respectively of the type bars and their pivotal supports. Fig. 15 is a fragmentary detail end view of the carriage sup-

porting means. Fig. 16 is a detail rear view of the type bar guide. Fig. 16^a is a detail end view of the line space mechanism.

The key levers 1 are pivoted at their rear ends by bearing upon a cross bar 2, and they overlie the universal bar 3 provided at its ends with rearwardly extended arms 3^a that are pivoted at 4 to the base of the machine. A link 5 extends through a lug 6 on the universal bar, which lug has a concave under surface to which is fitted the convex surface of a collar 7 held on the link by nuts 8. This forms an adjustable connection which allows an easy pivotal movement of the space frame, which is made up of the universal bar and its rearwardly extended arms 3^a, and without liability of the parts binding. The upper end of the link is pivoted to an arm 9 fixed to a rock shaft 10. A clutch section 11 (see Fig. 4) is fixed adjustably to this rock shaft and the tooth or end projection thereof engages a corresponding end projection on a loose collar or clutch section 12 which carries a rearwardly extending arm 13, to the rear end of which is pivoted a link 14, (Fig. 3) that has the upper end pivoted at 16 to a holding dog 15 of the escapement mechanism.

The link 14 is preferably made of two parts that are united by a turn buckle 17 in order that the link may be lengthened or shortened at will. The holding dog or pawl 15 has a laterally extending tooth 18, (see Fig. 8) with a vertically disposed edge to engage the teeth 19 projecting laterally from the feed rack 20 that is carried by the carriage. The holding dog is pivoted at 21 (see Fig. 3) to the post 22 extending up from the base of the machine and it is maintained normally depressed out of engagement with the rack by a spring 23, which is adjustable toward and away from the pivot of the dog 15 along notched bars 24, 25 connected to the dog and the standard respectively, so that the tension on the holding dog may be varied. A detent or feed dog 26 is pivotally connected with the standard 22 by a pin 27 which projects from the standard and passes through a slot 28 in the feed dog to permit a longitudinal movement thereof in the direction of the travel of the rack as well as a swinging movement around the pin 27 and at substantially right angles to the rack. This feed or stepping dog 26 engages the upwardly extending

teeth 29 of the feed rack and it has a laterally projecting pin 30 that extends in the path of a stud or cam surface 31 of the holding dog 15 so that when the latter is raised the cam surface will engage the pin 30 and lift the feed dog out of engagement with the rack teeth 29. In this movement, however, the tooth of the holding dog is brought into the path of the next or advancing tooth of the feed rack 19 and when the feed dog releases the rack, the paper carriage moves toward the left and the holding dog will be in position to arrest its movement when the carriage has moved the distance of one letter space, or one tooth of the rack. The feed dog 26 when released in the manner described is pressed to the right and downwardly by a spring 32 which engages the said dog at a point above and in rear of its pivot and as soon as the feed dog is raised out of engagement by the holding dog it is forced by its spring to the right the distance of one tooth of the feed rack and is moved into engagement with the next tooth thereof. The cam surface or projection 31 is formed so that the feed dog can engage the next tooth on the feed rack before the holding dog begins to descend and for this purpose the cam surface inclines downwardly and to the right so it may be made sufficiently narrow to simply lift the feed dog through the pin 30 and then when the feed dog is moved to the right by its spring the said pin will simply drop off of the projection 31, thus permitting the feed dog to engage the next tooth on the rack. From this construction it will be seen that the feed dog again effects an engagement with the rack immediately after its release and there is no possibility of the carriage skipping and a quick and efficient escapement is provided. The parts are so related and timed that the feed dog effects this second engagement with the teeth 29 of the rack before the type bar leaves the printing position and before the holding dog begins its descending movement. When the holding dog releases the teeth 19 of the rack, the feed dog which has engaged a tooth 29 and moves one step with the rack and carriage to the left when the pin 27 strikes the end of the slot 28 and the parts are arrested. In order to avoid any clicking sound of the feed dog in moving toward the right, which might be caused by the end of the slot 28 striking against the pin 27, I embed in the post 22 a buffer 33 of leather or other suitable material and a projection 34 on the feed dog strikes against this buffer and prevents any undesirable clicking noise. By adjusting the clutch 11 on the shaft 10 as well as the parts of the link 14, the escapement may be set to permit the movement of the carriage at different points relatively to the stroke of the type bar action. As shown, the escapement is set so that the carriage is released

after the type has made its imprint and has started back and is at a distance approximately one inch from the platen. By the use of the clutch 11—12 hereinbefore described, the release or escape of the carriage may be obtained with but slight movement of the holding dog.

Carriage release:—In order to release the carriage from the escapement so that it may be moved freely in either direction I provide a vertically disposed release rod or bar 34', (Figs. 3, 4 and 8), having an inwardly turned upper end 35 extending under a pin 36 on the feed dog 26. This release rod is guided through a bracket 37 of the post 22 and at its lower end is pivoted to a lever 38 connected with a hollow rock shaft 39 journaled in the base of the machine (Fig. 4). A key lever 40 is connected to the rock shaft and has a key 41 adjacent to the keyboard so that by depressing this key the release rod 34' will be elevated and the feed dog will be lifted from engagement with the feed rack and the carriage will be free to be moved in either direction. In addition to this carriage release mechanism I employ a bar 42 (Figs. 8 and 8^a) having inclined slots, through which pass screws 43 that take in threaded openings in the bar 20^a, of the carriage which supports the feed rack so that by pressing upon the thumb piece 44, (Fig. 1), at the left of the carriage, which is operatively connected to the bar 42 it will ride up on the screws 43 and its edge engaging with a forwardly projecting spur 45 on the feed dog will lift the dog and thus free the carriage. By the employment of carriage release just described the carriage in addition to being released can be positioned as desired by the operator, whose hand is at this time on the carriage and controls its movement; that is, it can be pushed toward the right or it can be allowed to move any distance toward the left under the action of its spring drum 46, which is connected with the carriage by a strap 45', Fig. 3. It will likewise be observed that by the employment of these means it requires but a single movement to release the carriage and to move it to the right to begin a new line of writing. When the carriage is released it can be controlled from the key board by an arm or lever 48 extending upwardly and just in rear and at the right hand side of the key board. Thus the arm 48 is connected to a sleeve or hollow shaft 49 that extends to the rear of the machine and turns on a shaft 50 journaled in the frame of the machine. The sleeve 49 has an upwardly extending arm or lever 51 connected thereto at its rear end and the arm is connected by a link 52 with the carriage frame at 53' (Fig. 3). By this arrangement the arm or lever 48 oscillates as the carriage travels from end to end of the machine, so that the operator may move the carriage from end to end of the machine by

the arm 48 when the carriage is released from its escapement mechanism, and the arm may be employed for returning the carriage toward the right after printing a line, without releasing the escapement mechanism.

Type bar action:—The type bar action consists essentially of a series of type bars 54 (see Figs. 1, 2, 7, 13 and 14) pivoted to a segmental bearing 55 in front of the platen, the said type bars inclining upwardly toward the front of the machine and normally resting with their upper ends upon a stop rail 56. Links 57 connect the lower ends of the type bars with sub-levers 58 and from the forward ends of these sub-levers, links 59 extend down to connect with the key levers 1. The sub-levers have laterally extending pivot pins or trunnions engaging a groove 60 formed in a slotted segmental bearing 61, supported on posts 62 of a platform 63, which platform also carries the arms 64 which hold the stop rail or rest 56 for the type bars and the comb plate 65 for the sub-levers 58. The bearing 61 is slotted at 66 to receive the sub-levers and the groove for the pivots extends along the front face of the bar so that the sub-lever pivots can be slipped into place from the front and the levers themselves properly disposed in their slots. The pivots may then be inclosed by the cover plate 67, Fig. 1, which is also slotted to permit the levers to extend therethrough but which prevents the pivots from being unseated from their bearings in the groove. The sub-levers are under tension of springs 68 (Fig. 1), which are secured thereto at their upper ends and are connected at their lower ends to hooks 69 which have threaded stems that pass through openings in the platform 63 and are held in place by nuts 70. By these means the tension on each spring may be varied and the springs are accessible from the front as the space between the platform and the bar 61 is unobstructed, the posts 62 being arranged at the ends of the bar.

The segmental bearing 55 consists of two parts 55, 55^a (see Fig. 13) and the latter part has a longitudinally extending groove in its upper face to receive the laterally projecting pintles or trunnions of the type bars and both parts are slotted transversely as shown in Figs. 1 and 2, to receive the type bars. The part 55 is removable so that any type bar may be taken out but as the pintles rest in the lower sections of the crown, the other type bars need not be disturbed in removing any one of them. The slotted portions of the bearing are of such shape that all except the lower part thereof is equi-distant from the pintle receiving groove so that the wearing surface of the type bars is substantially circular in form in order to reduce friction.

The type bars are recessed or have circular grooves 54^a around the pintles as shown in Fig. 14 in order to reduce the extent of bear-

ing surface and the friction between the type bars and their bearings. On the back of each type bar a projection 71, (Fig. 7), is arranged opposite the space between the upper and lower case type on the face of the bar. This projection is slightly greater than the height of the type so that in case two keys are struck about the same time the type on the bar which moves forward last will not come in contact with the back of the bar which is at or adjacent to the printing point but the body of the last operated bar will strike the projection 71, of the first actuated bar, as shown in Fig. 7, thus preventing the type from being damaged by the clash.

Type bar guide and line gage:—The type bar guide 72 in the present instance is made of separate, removable and adjustable pieces or guides. The ends or contact faces are rounded and hardened so as to present a small surface and avoid friction, and extending rearwardly from the guides are arranged projections 73, (Figs. 1 and 2), which extend to and terminate at the line of printing which is indicated by the dotted line 74 in Fig. 2. In this manner indicating means are provided for determining the proper positioning of the paper with relation to the printing line.

Paper fingers 75 extend partly around the platen and guide the paper after it leaves the paper feed roll 76. These fingers are adjustably connected to the scale 77 carried by the support 78 of the upper feed roller 76 and the fingers are provided with indicating lines 79 which are aligned with the printing line so that these indicating lines may be used in addition to the projection 73 hereinbefore described to adjust or position the paper with relation to the printing line, when filling in partly printed blanks or for the purpose of making corrections etc. The vibrator is likewise provided with a printing point indicator 116 which is located adjacent to the printing point and co-operates with the scale 77.

Ribbon movement:—The ribbon 80 (see Figs. 1 and 2) is carried by fingers or clips 81 of a vibrator 82 which is secured to a bent downwardly extending bar 83 which slides in guides of the bracket 84 which supports the segment 55 while the vibrator itself slides in fixed guides 82^x on the arms 72. The slide bar 83 is slotted at 85 (Fig. 2) and has a pin 83^x (Fig. 1) which is engaged by the forked end of an arm 86 that is fixed on a rock shaft 87, journaled in the bracket 88. The rock shaft has an arm 89 connected by a link 90 with an arm 91 fixed to the rock shaft 10 before mentioned; so that each time the rock shaft 10 is moved by the depression of the universal bar, through the actuation of a key, the vibrator will be moved rearwardly and upwardly from the position shown in Fig. 2 to a position where the ribbon will cover the printing point and be interposed in

the path of movement of the type of the type bars. The arm 91 is slotted and the link 90 is adjustably connected therewith, so that the vibrator can be given a longer or shorter throw and the ribbon can be moved transversely to a greater or less extent to bring different portions of it over the printing point. From the vibrator, the ribbon extends toward the ends of the machine around rollers 93 and thence at right angles toward the front of the machine over rollers 94, and thence downwardly to the ribbon spools 95 which are arranged so as to be easily accessible at each side of the type bar segment. These spools are arranged on a shaft 96 (Figs. 9 and 10) that extends across the machine and is journaled in a part of the bracket 84 close up under the type segment. The ribbon spools are held against longitudinal movement on the shaft by arms 97 that extend from the bracket and engage in grooved hubs 98 of the spools. The shaft 96 is capable of endwise movement in its bearings independently of the spools and in either extreme position one of the clutches 99 secured to the shaft near the ends thereof, will engage a tooth or a pin 100 of the associated ribbon spool, so that one spool will turn with the shaft to wind the ribbon while the other spool is free to unwind. The shaft has a button 101 at each end by which it may be moved in a longitudinal direction to throw one clutch out of engagement with its spool and to throw the other clutch into engagement with its spool. At about the center of the shaft 96 is splined a worm wheel 102 which is held against longitudinal movement on the shaft by apertured lugs 103 through which the shaft extends and which are located on opposite sides of the worm wheel and project from a bracket 104 attached to the segment supporting bracket 84. This bracket 104 supports a shaft 105 which extends at right angles to the shaft 96 and has a worm wheel 106 at one end thereof that engages the worm 102 of the ribbon spool shaft. At its opposite end the shaft 105 has a ratchet wheel 107 engaged by a pawl 108 that is carried by a gear wheel 109 that is loose on the shaft 105 and which meshes with a rack 110 secured to the front bar of the paper carriage. By this arrangement each movement of the carriage in the direction of its feed will move the rack 110 and through the gear 109, the ratchet mechanism and the worm gear connections will turn a ribbon spool shaft to move the ribbon longitudinally across the printing point. On the return of the carriage to the right, the gear 109 rotates in an opposite direction, carrying the pawl 108 freely over the teeth of its ratchet wheel, so that the gear 109 simply runs free and does not effect a feed of the ribbon.

To the bracket 104 is pivoted a latch 111, the end of which engages in a groove 112 in

the ribbon spool shaft. The latch is connected to one end of a spring 113 that has its opposite end connected to the bracket, and the movement of the latch is limited by the stop pins 114, 115. When the ribbon spool shaft is moved longitudinally the latch will be carried around its pivot with it, together with the upper end of the spring 113 and the force of the spring will accordingly be exerted on the shaft in either direction and tend to maintain the shaft in the longitudinal position to which it has been moved.

Paper carriage:—The paper carriage comprises a frame 117 arranged in inclined position and having bearing rollers that run upon stationary tracks 118, 119, supported from the base of the machine. The rollers have trunnions with which cone bearings co-operate; the bearings being held in place by set screws as shown in the detail Fig. 15. The track 118 is supported upon a shoulder 119' of the post 120, by a screw 121 and the track is grooved on its upper face to receive the carriage rollers and prevent lateral displacement of the carriage, whereas the carriage is held against upward displacement by small rollers 122 that extend under the track rail and project laterally from depending arms that project from the carriage. This arrangement allows the carriage as a whole to be run off the tracks, when desired, without dismounting the tracks or rollers. The platen is journaled in a frame 123 which is connected with and supported from the carriage frame 117 by parallel links 124 and 125 so that the platen frame may have a transverse shifting movement to change from the lower to upper or from the upper to lower case printing position. The links 125 have downward extensions which carry a cross rod 126 that extends across the machine and is engaged by the fork of a lever 127 fixed to a rock shaft 128 that is journaled above the base of the machine. This rock shaft is connected by an arm 129 and link 130 with the key lever 131, which has the upper case key attached thereto. By depressing this key the forked arm will rock the links 125 and shift the platen frame with the platen and the platen frame being arranged on an incline will drop back to the lower case printing position by gravity. In order to prevent shock when the platen drops back and to render the shifting movement of the parts easy, a contractile spring 132, (Fig. 2) is connected at one end to the platen frame 123 and at its opposite end to the carriage frame 117.

Paper feed rolls:—As before stated the paper feed roll 76 (Figs. 1, 2, 5, 11 and 12) is carried in supporting arms 78. These arms are pivotally supported upon a cross bar 78' carried by the brackets 133 (Fig. 1) forming part of the platen frame and curving about the under side and to the rear of the platen. As has been heretofore pointed

out the arms 78 support a platen scale bar 77 on which paper guiding fingers 75 that conform in part to the curvature of the platen are carried and along which said fingers may be adjusted. These fingers 75 carry margin feed rollers 75^x as shown in Fig. 2. The roll supporting arms 78 are under pressure of leaf springs 78^{''} (Fig. 5) secured thereto and bearing upon the front bar 123['] of the platen frame. The lower set of paper feed rolls 76['] are carried on a shaft 76^{'''} journaled in arms 76^{'''} extending from a rod or rock shaft 76^a which is journaled in the bearings 133 before mentioned. The arms 76^{'''} are under pressure of leaf springs 76^e each secured at one end to the paper shelf 76^d so that the lower paper feed rolls will be forced against the platen. In order to release both sets of rolls and the margin feed rollers from the platen simultaneously I provide a lever 134 secured on the left hand end of the shaft 76^a so that by pressing this finger lever to the rear the rock shaft 76^a will be turned so that the projections 76^e and 76^f thereon (Fig. 3) will move respectively the supports 78 of the upper feed roller and margin feed rollers and the shaft 76^{'''} of the lower set of rollers to move the rollers away from the platen, it being understood by reference to Fig. 3 that the arms or projections 76^f extend across the front side of the shaft 76^{'''}. When the feed rolls are moved away from the platen the paper can be readily inserted or withdrawn or moved about to get any desired adjustment or positioning thereof.

Line space mechanism:—At the left of the platen there is a ratchet wheel 135 (Fig. 16^a) with which engages a pawl 136 pivoted at 136^a to a stud 137 which is swiveled on a vertically disposed pivot to one arm of a bell crank or angular lever 138 that is pivoted to an ear 139 (Figs. 1 and 2) on the platen frame back of the platen, the other arm of this lever being connected through a link 140 (Fig. 3) to an arm 141 on the rock shaft 50. This rock shaft 50 extends fore and aft of the machine from the rear to the front thereof through the hollow shaft or sleeve 49 hereinbefore referred to, and has an upwardly extending actuating arm or lever 48['] adjacent to the key board (Figs. 1 and 2). By moving this arm the line space pawl will be operated through the intermediate connections to turn the platen step by step for the line spacing. The arm 48['] is moved toward the right in this action, and a spring 142, (Fig. 1), coiled about the rock shaft returns the line space mechanism to normal position. A locking lever 143 (Fig. 16^a) is pivoted to the platen frame at 144 and has its upper end resting upon the shoulder on the line space pawl so that as the pawl is drawn backwardly to turn the platen, the lower end of the locking lever will be thrown against the teeth of the ratchet wheel and lock the platen

against movement. A detent roller 145 is carried by an arm 146 pivoted at 147 to the platen frame and a contractile spring 148 normally pulls this arm down and causes the detent roller to bear upon the teeth of the ratchet wheel and prevent an accidental displacement thereof. This roller also serves in connection with the locking lever 143 to insure the accurate positioning of the platen at each line space movement and there is no liability of the roller riding up on the teeth or an overthrow of the platen as might be the case were the locking lever omitted and the roller alone relied upon. This might result in an irregularity in the printed line, as the jarring of the machine might cause the platen to turn slightly after the line of printing had been begun and to continue to turn until the roller rested in the lowest position between the teeth and this would cause the first part of the line to be out of alinement with the last part, which latter part only would be in the correct position. In order to change the spacing of the lines a controlling piece or adjustable device 148['] (Fig. 16^a) is carried pivotally by the forward upturned end of the arm 146, said piece having a button at the upper end and a lateral extension at its lower end so that by grasping the button and giving it a partial turn the lower end of the controlling piece will ride against the edge of the pawl and lift the same sufficiently to miss one tooth when said pawl moves toward the rear of the machine. The pawl 136 moves in the same plane as the line spacing wheel and the throw thereof is regular or the same for different extents of line spacing and it is normally out of engagement with the ratchet wheel and the platen can therefore be turned in either direction by turning either of the finger wheels at the ends thereof. The pawl 136 rests upon the roller 145 and when the platen is turned the roller is lifted slightly by the teeth so that the pawl partaking of this movement will be lifted still farther away from the teeth. The pawl has a cut out portion with an inclined or cam edge 136^b which enables the pawl to maintain engagement with and to follow up the teeth of the line spacing wheel as a line spacing movement is transmitted to the platen and to disengage the pawl from the teeth of the wheel during the forward or return movement of the pawl. In the upper side of the pawl 136 a notch 149 (Fig. 1) is formed and by lifting the pawl this notch is engaged by a cross bar 150 (Fig. 6) of the guide 151 on the arm 148, through which guide the pawl extends. When so engaged the spring 148 exerting pressure on the parts, will serve to hold the pawl, the arm 146 and the roller 145 elevated, so that the platen will be perfectly free and may be adjusted without regard to the ratchet teeth and roller. By this mechanism the machine is adapted for use in fill-

ing in partly printed blanks in which the spaces between the lines vary.

When it is desired to return the carriage for a new line and at the same time turn the platen, the arms or levers 48 48', are grasped between the thumb and forefinger and pressed together and both arms are then moved together toward the right or if desired the same result may be accomplished by merely swinging the finger piece or arm 48' from left to right. From an inspection of Figs. 1 and 2 it will be seen that there is a forward extension 48^x on the arm 48 with which the arm 48' is adapted to contact after the line spacing movement has been effected so that the two arms will move together. But there is, nevertheless, no necessity for moving the two levers together to effect the line spacing and return of the carriage because a single movement of the arm 48' would be effective for this purpose. By returning the carriage through the arm 48' by the co-operation thereof with the arm 48 the line spacing mechanism is relieved of the strain incidental to returning the carriage by a pressure exerted through said line spacing mechanism. When it is desired to return the carriage without spacing for the line it is simply necessary to turn the arm 48.

From the foregoing description it will be seen that the axis of the pivot 136^a of the line spacing pawl 136 extends parallel to, or substantially parallel to, the axis of the platen, whereas, the axis of this vertical pivot which unites the part 137 to angular actuating lever 138 is at right angles to the axis of said first mentioned pivot, so as to form a universal joint between the line spacing pawl and its angular actuating lever. It will also be seen that the rock shaft 50 extends fore and aft of the machine and that the movement of the substantially horizontally disposed line spacing pawl is fore and aft of the machine or in the general direction of the length of said rock shaft and that the rocking motion of said shaft transmits a line spacing movement to the pawl through the universal joint. Furthermore, it will be seen that although the line spacing mechanism is carried in part by the shiftable platen frame and in part by the framing of the machine or a part that remains fixed during the case shifting movements of the platen frame and that although the different parts of the line spacing mechanism are positively connected, they do not interfere with the platen shifting movements nor do the shifting movements of the platen frame affect the line spacing mechanism.

I show in Figs. 11 and 12 a modified arrangement of paper feed roll and paper fingers in which case the arms 78^x are substantially the same as the arms 78 before described, being pivoted to curved brackets 133 of the platen frame. The ends of these arms 78^x carry the paper roller 76, and the said

arms have upward extensions to which the graduated paper scale 77 is attached on the under side. Arms 78^a are pivoted to the platen frame outside of the arms 78^x and carry at their upper ends a cross rod 78^b on which slides a block, carrying the paper fingers 75' which are provided with small rollers 75". The arms 78^x on the opposite side of the feed roller 76 carry the cross rod 78^c and the paper fingers have tail pieces or extensions bearing upon this cross rod. Springs *a* attached to the platen frame bear upon the arms 78^a, and the paper fingers are made of spring metal and are of such form that when the arms are pressed by the springs *a* the fingers will be under spring tension and the roller carried thereby will be held against the platen so that after the paper leaves the feed roll 76 it will be engaged by the paper finger rollers. The feed roll 76 and the arms 78^x are forced toward the platen by the pressure exerted on the pivoted arms 78^a and rods 78^b, by the springs *a*. The arms 78^x may be operated by the lever 134 as before described and when so operated the paper fingers and the feed roll 76 will be released from contact with the paper simultaneously. The paper fingers can be moved or adjusted along the supporting rods longitudinally of the platen to properly position them to co-operate with paper of different widths.

I will now describe my improved combined carriage release, line lock and marginal stop device.

Within the hollow shaft 39 (Fig. 4) is a shaft 151^x, to which are respectively attached the forwardly extending lever 152 and the rearwardly extending lever 153 having upon its rear end a forked shaped portion 154 which engages the shaft 155, (Figs. 1, 3^a and 4). A line lock lever 156 having an elongated eye 157 (Fig. 4), through it at its rearward end is located directly over a hole 158 cut in the base plate, and over the forked arm 154. The shaft 155 operates within the eye 157 and turns, through an eccentric portion thereof, the lever 156 upon its fulcrum 159, and throws the forward end of said lever under the arm 9, thus locking it against movement, and preventing the types from striking the paper upon the platen. The manner in which this shaft 155 is turned will be hereinafter more fully explained. As before described when it is desired to release the carriage, so that it may be moved in either direction, the lever 40 is pushed downward by depressing the key 41 upon its forward end, marked "Carriage release," which raises the lever 38 and the release bar 34', thus lifting the feed dog from the rack.

From an inspection of Fig. 3^a it will be observed that a bell 160 is attached to the bracket 161 and that the lever 162 carries a hammer at one end and a bell trip 163 at its

other end, to engage with the pin 164 on a graduated rod 165. This rod is carried by the carriage and may be adjusted thereon to bring the pin 164 in such position that the bell will be sounded several letter spaces before the end of the line is reached or before the pin 164 engages with the stop 166, and locks the machine against further printing and the carriage against further movement. When the pin 164 strikes the bell trip 163, it carries the upper end of the lever 162 with it until the pin moves out of contact with the trip and the bell hammer drops by gravity upon the bell and sounds the alarm. A stop pin 167 projects from the bracket at a point where it will arrest and normally maintain the bell lever out of contact with the bell. The portion of the lever 162 which carries the hammer may be made resilient, to permit the bell hammer to spring down when the lever strikes the pin 167 and thus strike the bell and then rebound and remain at a short distance from it. The trip 163 is pivoted upon the upper end of the lever 162 and has a tail piece 168 (Fig. 3^b) that normally rests against the lever and is held in this position by gravity. The relation of the parts is such that when the carriage is moved from right to left, the pin 164 will contact with the trip and cause the lever 162 to move with it to sound the alarm. When, however, the pin 164 contacts with the trip 163 in the return movement of the carriage toward the right, the trip will merely be turned on its pivot without moving the lever 162 and without sounding the alarm.

The vertically disposed shaft 155 has its bearings in the projecting portions of the bracket 161 and on its upper end is secured the stop or dog carrying block 169 which is shown in detail in Fig. 3^c and to which are pivoted the stops or dogs 166 and 166' as shown which are at different heights (see Fig. 1). To hold these stops in their proper and normal position the springs 170 (Fig. 3^e) which are each secured at one end to the carrier, are made to bear against the rear ends of said stops 166 and 166'. At the lower end of the shaft 155 a groove is cut to receive the forked end 154 of the lever 153, (see Fig. 1), and around the shaft 155 is a coiled expansion spring 171 the upper end of which is connected to the bearing 172 for the shaft, the lower end being secured to a collar 173 adjustably secured to the shaft 155.

Attached to the lugs 174, carrying the carriage rolls, and extending from one end of the carriage frame to the other is a thin plate-like piece or strip of metal 175, Figs. 1 and 3^a, forming a bed for the sliding rods 165 and 165^x carrying the pins 164 and 164' respectively which are at different heights and are adapted to engage the stops 166 and 166' respectively. Attached to this thin strip of metal 175 are grooved strips which with the

piece 175 form dove-tail grooves or slide-ways for the graduated bars 165 and 165^x. The upper bar 165 regulates the right hand margin on the paper, sounds the alarm and establishes the point of locking the machine, whereas the lower bar 165^x simply regulates the left hand margin on the paper.

Pivoted latches 176 on the ends of the carriage drop by their own weight into the notches on the bars 165 and 165^x and hold them against endwise movement with relation to the carriage. These sliding bars are provided with graduations on the sides facing the operator and have on their ends suitable finger pieces by means of which the bars may be moved longitudinally on the carriage, enabling the operator to readily adjust the bars and thus regulate the margin, the alarm and the line lock mechanisms so that they may be set to operate at any desired point.

In the bracket 161 is a pin 177 (Figs. 3^a, 3^c, 3^d) which extends into a recess in the circular base 178 of the stop block 169 so as to limit the turning movement of the shaft 155 and the block 169 carried thereby.

The operation of this margin regulator and line lock is as follows:—Suppose it is desired to lock the machine at the point 65 on the scale, thus leaving say a margin of five letter spaces on the right hand edge of a sheet of paper. To do this the operator raises the latch 176 on left hand end of carriage, draws out the sliding bar 165 until the proper numeral in the graduations on the bar comes under the latch, then the latch is dropped into a notch at that point and the operator proceeds to write. When the carriage approaches the end of the line the pin 164 will first vibrate the bell trip and hammer and the alarm will be sounded. Then the carriage arrives within five spaces of its stopping point at the extreme end of the line, the pin 164 in the bar 165 comes in contact with the stop 166 and the shaft 155 is turned as far as the pin 177 and block 169 will permit. This movement is communicated to the lever 156 and the forward end of said lever is thrust under the arm 9, Fig. 4, and the machine is locked. Should the operator desire to unlock the line lock mechanism to insert additional letters, or characters to complete a word, or add a hyphen, it is merely necessary to depress the key marked "Line lock" on the forward end of lever 152, (Fig. 4), which turns the shaft 151^x and elevates the rear end of the lever 153 thereby raising the shaft 155 to a point where both the stops 166 and 166' are thrown up out of the path of the pins on the sliding bars 165 and 165^x, thus disengaging the dog 166 from the pin 164. The coiled spring 171 serves a double purpose, in that it returns the shaft 155 with its block or carrier 169 to its lowermost normal position as soon as the finger is raised from the line lock key, and turns the shaft back to its nor-

mal position when a dog is disengaged from its pin, either by depressing the line lock release key or by moving the carriage to a position where the pin no longer contacts with its associated stop or dog. When the shaft 155 is turned back to the normal position it carries the forward end of the lever 156 from under the arm 9 and thus unlocks the machine. If the operator desires to regulate the left hand margin on the paper so that the printing will begin at say ten letter spaces from the side, he simply raises the latch 176 on the right hand side of the carriage, draws out the bar 165^x until ten letter spaces are indicated by the graduations on the bar, drops the latch into the notch which has been brought beneath the latch and proceeds to write. This adjustment of the bar draws the pin 164' ten letter spaces toward the right and it comes in contact with its stop 166' ten spaces earlier than when in position to permit a full travel of the carriage to the right and makes the margin uniformly ten spaces from the beginning of the line. Should the operator desire to write notes within the margin, it is simply necessary to depress the line lock key; which raises the shaft 155 and the stop 166' is raised out of the path of the pin 164' when the carriage can be moved to the extreme right.

It will be observed that the stops 166 and 166' are placed on opposite sides of the block or carrier 169 and are free to move around their pivots independently of the carrier in opposite directions, so that when the carrier is raised to enable the operator to either write within the margin or to add one or more characters at the end of the line the reverse movement of the carriage past the stop will cause the pins to move their respective stops around the pivots thereof without turning the shaft 155 and without interfering with the free movement of the carriage.

From the foregoing description of the line lock and margin stop mechanism it will be seen that the line lock stop 166 is carried by the frame of the machine and has three motions, one a swinging motion with the bar or rock shaft 155 at the end of a line to effect a line locking operation, another motion upwardly with the shaft 155 to take said stop out of the path of the co-operating stop on the carriage, and a third motion an independent pivotal movement on the block 169 without moving the rock shaft, to enable the co-operating stops to pass one another freely in the return movement of the carriage.

Certain of the features herein shown and described are not claimed herein, but will constitute the subject-matter of separate divisional applications.

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

1. In a typewriting machine, the combination of a universal frame, an escapement

mechanism, a link extending from the frame to the said mechanism, and a connection between the link and the said frame, said connection comprising a lug and collar, one having a concave and the other a convex bearing surface, and the holding nuts, substantially as described.

2. In combination, the escapement, the rock shaft having a loose arm connected therewith, an adjustable clutch section on the rock shaft to engage a clutch section on the loose arm, and key mechanism for operating the rock shaft, substantially as described.

3. In combination, the escapement, the rock shaft having a loose arm, the link connection between the loose arm and the escapement, said link being adjustable, an adjustable clutch member on the rock shaft to engage a clutch member on the loose arm, and key mechanism for operating the rock shaft, substantially as described.

4. In a typewriting machine, the combination of a carriage, a feed rack, a pivoted holding dog with means for moving the same, a sliding detent, or feeding dog having a pin, a narrow projection or cam on the holding dog and which is adapted to engage the said pin and allow the pin to immediately fall therefrom, with means for sliding the detent, whereby as soon as the detent is released by the pawl it will slide forwardly into engagement with the next tooth of the rack irrespective of the return of the holding dog to normal position, substantially as described.

5. In a typewriting machine, the combination of a carriage, a feed rack therefor, a dog which co-operates with said rack, a bar connected to said dog, a second fixed bar, and a spring connected to said bars and adjustable along them.

6. In combination, the carriage, the double rack bar, a pivoted pawl engaging one set of teeth, a sliding detent for engaging the other set of teeth, means whereby the detent is operated by the movement of the pawl, and a carriage release bar for operating the detent independently of the pawl with means for operating the release bar from the key board, the said pawl being normally out of engagement with the rack bar, substantially as described.

7. In combination, the carriage having a double rack bar, the pawl normally out of engagement therewith with means for operating the same, the sliding detent with the pin 30 and projection 31 for operating the same, a pin 36 on the detent, a carriage release rod 34 having a bent upper end extending under the pin 36 and means for operating the release bar, substantially as described.

8. In combination in a typewriter, the platen, the paper scale, the type bar guides adjacent to the printing point, and line gages consisting of projections extending from said

type bar guides to the line of printing, said gages being independent of the scale, substantially as described.

9. In combination in a typewriter, the platen, the paper scale, projections extending to the line of printing on each side of the printing point and constituting line gages, said projections being independent of the paper scale, substantially as described.

10. In combination with the platen, the paper scale, the line gages arranged on each side of the printing point and extending to the printing line and independent of the paper scale, and the gages near the ends of the platen in line with the printing line, substantially as described.

11. In combination with the platen, the line gages arranged on each side of the printing point and extending to the printing line, the scale and the paper finger thereon and having marks in line with the printing point, substantially as described.

12. In combination, the type bar guides, the line gages extending therefrom on each side of the printing point, the bar extending longitudinally of the platen, the paper fingers adjustable on said bar and having marks in line with the printing line, substantially as described.

13. In combination, the carriage, the platen, the line space mechanism, a pair of levers at the key board, rock shafts extending from the levers rearwardly, and connections between the said rock shafts and the carriage and line space mechanism respectively, whereby the carriage can be returned with or without turning the platen, substantially as described.

14. In combination, the carriage, the platen, the line space mechanism, a pair of levers at the key board, the rock shafts extending therefrom one within the other, the levers at the rear of said rock shafts and the connections between the said last mentioned levers and the line space mechanism and the carriage respectively, substantially as described.

15. In combination, the platen, the paper feed rollers 76 at the front, the pivoted supports therefor, the feed rollers 76' at the rear, the pivoted supports therefor, the springs in connection with said supports, the rock shaft journaled in the platen frame and the projections thereon for operating the supports to adjust the position of the rollers, substantially as described.

16. In combination with the platen, the line space pawl and a pivotal locking lever having one end arranged in the path of the said pawl, said locking lever having its other end arranged to engage the teeth of the ratchet after the line space pawl has made a certain movement, substantially as described.

17. In combination, the platen, the ratchet, the line space pawl, the locking lever to engage the ratchet, said locking lever being in

the path of the pawl to be operated thereby, the pivotal arm 146 under spring pressure and the roller carried by said arm and engaging the teeth of the ratchet, said locking lever being pivoted intermediate of its length and independent of the line space pawl, substantially as described.

18. In combination, the paper roll with its ratchet, a pawl for operating the same, and a locking lever for engaging the ratchet, both the operating pawl and locking lever being normally out of engagement with the ratchet and said locking lever being moved into engagement with the ratchet by the operation of and contact with said pawl and by the same movement of the pawl which turns the ratchet, substantially as described.

19. In combination, the pawl, the line space ratchet, the spring pressed roller bearing on the ratchet teeth and the two armed locking lever to engage the ratchet teeth and arranged with one arm in the path of the pawl to be operated by the same, substantially as described.

20. In combination, the platen, the ratchet, the line space pawl, the spring pressed pivoted arm 146 having a guide for the pawl said pawl having a notch adapted to engage the guide when lifted whereby the said pawl together with the arm 146 and its roller will be held elevated from the ratchet, substantially as described.

21. In combination, the ratchet, the line space pawl, and a controlling piece consisting of a rock shaft having a bent end adapted to engage the lower edge of the pawl and a finger button whereby the controlling piece may be turned to co-operate with the pawl and the line space varied, substantially as described.

22. In combination, the platen, the pivoted arms carrying the paper feed roller, the second pair of arms arranged outside of the first pair and carrying the cross rod with sliding blocks and paper fingers, the rollers in said paper fingers, the springs *a* for applying tension to the outer pair of arms carrying the paper fingers, means for operating the inner pair or arms, said inner pair being arranged to lift the paper fingers from the platen simultaneously with the release of the feed roll by the movement of the second pair of arms, substantially as described.

23. In a typewriting machine, the combination of a carriage, a feed rack therefor, a holding dog and a feed or stepping dog normally in engagement with the rack and which is disengaged therefrom by the holding dog and which re-engages the rack independently of the movement of the holding dog.

24. In a typewriting machine, the combination of a carriage, a feed rack therefor, a holding dog, and a feed or stepping dog which moves independently of the holding

dog in two directions and which is released from the rack by a movement of the holding dog and which re-engages the rack by a movement independent of the holding dog.

25. In a typewriting machine, the combination of a carriage, a feed rack therefor, a holding dog which is normally out of engagement with the rack, a feed or stepping dog which is normally in engagement with the rack and with which the holding dog contacts during the movement of the latter into engagement with the rack, and means which permit the stepping dog to free itself from contact with the holding dog and to re-engage the rack before the return movement of said holding dog.

26. In a typewriting machine, the combination of a carriage, a feed rack therefor, a holding dog which is normally out of engagement with the rack, a cam on said holding dog, a feed or stepping dog which is normally in engagement with the rack and with which the cam on the holding dog contacts during the movement of the latter into engagement with the rack, and means which permit the stepping dog to ride on said cam and to re-engage the rack before the return movement of said holding dog.

27. In a typewriting machine, the combination of a carriage, a feed rack therefor, a holding dog which is adapted to move at right angles to the rack and which is normally out of engagement therewith, a projection on said holding dog and a feed or stepping dog which is adapted to move at right angles to the rack and in the direction of the travel thereof and which is provided with a pin that is adapted to be engaged by the projection on the holding dog during the movement of the latter into engagement with the rack and to clear itself of said projection during the movement of the stepping dog in the direction of the travel of the rack, whereby said stepping dog may re-engage the rack before the return movement of the holding dog.

28. In a typewriting machine, the combination of a carriage, a line lock stop, and a margin stop carried by said carriage, a vertically disposed longitudinally movable rock shaft, line lock mechanism controlled by said shaft, a line lock stop and a margin stop carried by the shaft and with which the line lock and margin stops on the carriage co-operate to lock the machine out of action when the carriage reaches the end of a line or to arrest the carriage in its movement to the right, and key actuated means for moving said shaft longitudinally to release the line lock mechanism or to permit the margin stop on the carriage to move to the right of the margin stop on the shaft.

29. In a typewriting machine, the combination of a carriage, adjustable line lock and margin stops carried thereby at different

heights, a vertically disposed longitudinally movable rock shaft, line lock mechanism controlled by said shaft, a pivoted line lock stop and a pivoted margin stop carried by the shaft at different heights and with which the adjustable line lock and margin stops on the carriage co-operate to lock the machine out of action when the carriage reaches the end of a line or to arrest the carriage in its movement to the right, and key actuated means for moving said shaft longitudinally to release the line lock mechanism or to permit the margin stop on the carriage to move to the right of the margin stop on the shaft.

30. In a typewriting machine, the combination of a carriage, a margin stop carried thereby, a vertically disposed longitudinally movable rock shaft, line lock mechanism controlled by said shaft, a margin stop carried by the shaft and with which the margin stop on the carriage co-operates to arrest the carriage in its movement to the right, and key actuated means for moving said shaft longitudinally to permit the margin stop on the carriage to move to the right of the margin stop on the shaft.

31. In a typewriting machine, the combination of a carriage, escapement mechanism therefor, margin and line lock stops carried by said carriage, a vertically disposed longitudinally movable rock shaft, a line lock and a margin stop carried by said rock shaft and with which the associated stops on the carriage are adapted to co-operate, a line locking arm controlled by said rock shaft and adapted to be interposed in the path of a moving part of said escapement mechanism, and key actuated means for moving said shaft in a longitudinal direction to carry the stops thereon out of the path of the stops on the carriage and thus release the line lock or permit writing within the left hand margin on the paper.

32. In a typewriting machine, the combination of a platen, independently movable spring-pressed pivoted carriers, parallel feed rollers carried by said carriers, whereby pressure may be applied to maintain one roller or set of rollers in contact with the platen or the paper thereon without affecting the pressure applied to the other parallel roller or set of rollers, and hand actuated means for simultaneously moving said carriers and feed rollers away from the platen.

33. In a typewriting machine, the combination of a platen, parallel feed rollers, a plurality of independent spring pressed pivoted carriers, which carry said feed rollers and are independently movable to force the feed rollers into contact with the platen or the paper thereon, and hand actuated means for simultaneously moving the pivoted carriers on their pivots to simultaneously move the parallel feed rollers out of contact with the platen or the paper thereon.

34. In a typewriting machine, the combination of a platen, parallel feed rollers, a plurality of independent spring pressed carriers for and which are pivoted intermediate of the parallel feed rollers and are independently movable to force the feed rollers into contact with the platen or the paper thereon, and hand actuated means for simultaneously moving the pivoted carriers on their pivots to simultaneously move the parallel feed rollers out of contact with the platen or the paper thereon.

35. In a typewriting machine, the combination of a platen, a plurality of parallel feed rollers, a plurality of independently movable pivoted carriers for said parallel feed rollers, said carriers being pivoted intermediate of the feed rollers, a rod that extends longitudinally of the platen, hand actuated means for moving said rod, and means associated with said rod and operative to simultaneously move the parallel feed rollers away from the platen.

36. In a typewriting machine, the combination of a platen, a plurality of parallel feed rollers, a plurality of independently movable pivoted carriers for said parallel feed rollers, a rock shaft with operative connections to said carriers, and hand actuated means for turning said rock shaft.

37. In a typewriting machine, the combination of a platen, a plurality of parallel feed rollers, a plurality of independently movable pivoted carriers for said parallel feed rollers, said carriers being pivoted intermediate of the parallel feed rollers, a rock shaft with operative connections to said carriers, and hand actuated means for turning said rock shaft to effect a movement of the parallel feed rollers away from the platen.

38. In a typewriting machine, the combination of a platen, a plurality of parallel feed rollers, a plurality of independently movable pivoted independently spring pressed carriers for said parallel feed rollers, a rod with operative connections to said carriers, and hand actuated means for moving said rod to effect a movement of the parallel feed rollers away from the platen.

39. In a typewriting machine, the combination of a platen, a plurality of parallel feed rollers, independent pivoted independently spring pressed carriers for said parallel feed rollers, a rock shaft, means for affording a simultaneous movement of the different carriers away from the platen when said rock shaft is turned, and hand actuated means for turning said rock shaft.

40. In a typewriting machine, the combination of parallel feed rollers, independent carriers for said feed rollers, said carriers being pivoted intermediate of the feed rollers, means for affording independent pressure on the different parallel feed rollers, a rock shaft located intermediate the parallel feed rollers,

operative connections from the rock shaft to the feed rollers for simultaneously moving all of said feed rollers away from the platen when said rock shaft is turned, and a finger piece for turning said rock shaft.

41. In a typewriting machine, the combination of parallel feed rollers, at least one of said parallel feed rollers being divided to provide a series of independently rotatable rollers on the same shaft, independent carriers for said parallel feed rollers, said carriers being pivoted intermediate of the feed rollers, means for affording independent pressure on the different parallel feed rollers, and hand actuated means for simultaneously moving the feed rollers away from the platen.

42. In a typewriting machine, the combination of parallel feed rollers, at least one of said parallel feed rollers being divided to provide a series of independently rotatable rollers on the same shaft, independent carriers for said parallel feed rollers, said carriers being pivoted intermediate of the feed rollers, means for affording independent pressure on the different parallel feed rollers, a rock shaft located intermediate the parallel feed rollers, operative connections from the rock shaft to the feed rollers for simultaneously moving all of said feed rollers away from the platen when said rock shaft is turned, and a finger piece for turning said rock shaft.

43. In a front strike typewriting machine, the combination of main feed rollers at the rear of the platen where the paper is introduced, margin feed rollers at the front of the platen near each end thereof, and hand actuated means for simultaneously moving said main and margin feed rollers out of contact with the platen.

44. In a typewriting machine, the combination of a platen, pivoted spring-pressed carriers, parallel feed rollers carried by said carriers and extending substantially throughout the length of the platen, margin feed rollers carried by said carriers, and hand actuated means that cooperate with said carriers to simultaneously move the rollers away from the platen.

45. In a typewriting machine, the combination of a platen, pivoted spring-pressed carriers, parallel feed rollers that co-operate with said platen and which are carried by said carriers, hand operated means for moving said rollers away from the platen, and paper guiding fingers that are also simultaneously moved away from the platen.

46. In a typewriting machine, the combination of a platen, pivoted spring-pressed carriers, parallel feed rollers that co-operate with said platen and which are carried by said carriers, hand operated means for moving said carriers, paper guiding fingers that are moved away from the platen by said carriers, and margin feed rollers carried by said guide fingers.

47. In a typewriting machine, the combination of a platen, main paper feed rollers, independently supported margin feed rollers which cooperate with the paper at the margin thereof, and means for simultaneously moving all of said feed rollers away from the platen.

48. In a typewriting machine, the combination of a platen, parallel spring-pressed main paper feed rollers, independent spring-pressed margin feed rollers, and means for simultaneously moving the parallel main paper feed rollers and margin feed rollers away from the platen.

49. In a typewriting machine, the combination of a platen, pivoted spring-pressed carriers, parallel feed rollers that are carried by said carriers, spring paper guide fingers, margin feed rollers carried by said guide fingers, and hand operated means for simultaneously moving all of said feed rollers away from the platen.

50. In a typewriting machine, the combination of a platen, paper feed rollers, a rock shaft on which said feed rollers are supported, paper guide fingers that extend transversely of the platen and that conform to the curvature thereof, crank arms that extend from the rock shaft and which are adapted to throw the guide fingers out of contact with the platen, and a finger piece connected to said rock shaft and by which it may be rocked to simultaneously move the feed rollers and paper guide fingers away from the platen.

51. In a typewriting machine, the combination of a platen, paper fingers co-operating with the forward side of said platen, feed rollers co-operating with said platen, and a hand operated rock shaft and connections for simultaneously moving said feed rollers and said paper fingers away from said platen.

52. In a typewriting machine, the combination of a platen, paper fingers that are curved to conform substantially to the curvature of the platen, main feed rollers co-operating with said platen, and a single hand operated device for simultaneously moving said paper fingers and said feed rollers away from the platen.

53. In a typewriting machine, the combination of a platen, paper feed rollers, independent paper guide fingers that are curved to conform substantially to the curvature of the platen and that are pivoted beneath the platen independently of said feed rollers and extend up in front thereof transversely of the platen, and hand operated means for simultaneously moving said guide fingers and feed rollers away from the platen.

54. In a typewriting machine, the combination of a platen, paper feed rollers engaging the rear side of said platen, paper fingers extending transversely of said platen and engaging the forward side of the same, levers

pivoted beneath the platen and operable to move said paper fingers away from said platen, and a hand operated rock shaft, and connections for simultaneously moving said feed rollers away from said platen and operating said levers to move said paper fingers away from said platen.

55. In a front strike typewriting machine, the combination of a platen, a platen frame, parts pivoted to said platen frame beneath the platen and extending toward the rear of the platen and having a paper feed roller mounted thereon, other parts pivoted to said platen frame beneath the platen and extending toward the front of the platen and having front paper feed devices thereon, and hand operated means for simultaneously moving said rear and front paper feed devices away from the platen.

56. In a typewriting machine, the combination with a carriage stop, of a second stop mounted on the frame of the machine and adapted to have three motions, one caused by the carriage at the end of a line, another motion out of the path of the carriage stop, and a third motion to permit said carriage stop to pass said second stop freely in one direction.

57. In a typewriting machine, the combination of two co-operating stops, one of said stops being mounted on the carriage and the other on the frame of the machine, and one of said stops being adapted to have three motions, one motion caused by the other stop at one end of a line, another motion out of the path of said other stop, and a third motion to permit said stops to pass one another freely in one direction.

58. In a typewriting machine, the combination of two co-operating carriage stops, one of which is mounted on a movable bar, said stop being adapted to move said bar when the two stops come into engagement at one end of a line by the movement of the carriage in one direction, and to yield freely without moving said bar when said stops come into engagement by the movement of the carriage in the opposite direction.

59. In a typewriter, the combination with a platen provided with a line-spacing ratchet wheel, of a reciprocating dog to engage therewith and having an inclined face, and an adjustable device that is adapted to be maintained in a relatively fixed position in the path of said inclined face on the dog and adapted to be turned to one position to lift the dog for single line spacing or to be turned to another position to allow it to engage with another tooth of the ratchet for double line spacing.

60. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel connected thereto, line spacing mechanism co-operating with said ratchet wheel, a bearing roller which normally bears upon

the teeth of said ratchet wheel, means for moving said roller away from the teeth by a movement of a part of the line spacing mechanism, a locking pawl which is normally out of engagement but co-operates with said ratchet wheel, and means controlled by the movement of the line spacing mechanism for forcing the locking pawl by a positive pressure into engagement with the ratchet wheel.

61. In a typewriting machine, the combination with a carriage of an independently movable platen frame, and line spacing mechanism, said line spacing mechanism comprising a rock shaft, a finger piece for operating said rock shaft, an actuating arm connected to the shaft, an actuating lever carried by the platen frame, and a line feed dog operated by said actuating lever, whereby a single movement of the finger piece will actuate the line spacing mechanism and will restore the carriage to the right-hand side of the machine to begin a line of writing.

62. In a typewriting machine, the combination with a carriage and a platen carried thereby, of a ratchet wheel for said platen; a dog for operating said ratchet wheel; means situated behind said ratchet wheel for operating said dog; and a rock shaft extending fore and aft of the machine for operating said dog operating means.

63. In a typewriting machine, the combination of a platen, a carriage, an independently shiftable platen frame, a line spacing ratchet wheel connected with the platen, a line spacing pawl, an angular lever for actuating said pawl, and a rock shaft that extends fore and aft of the machine and is operatively connected to said angular lever to vibrate the lever through a turning of the rock shaft.

64. In a typewriting machine, the combination of a platen, a carriage, an independently shiftable platen frame, a line spacing ratchet wheel connected with the platen, a line spacing pawl which moves in substantially the same plane as the line spacing ratchet wheel, an angular lever for actuating said pawl, and a rock shaft that extends fore and aft of the machine and is mounted in bearings on a fixed portion of the machine, said rock shaft being operatively connected to said angular lever to vibrate the lever through a turning of the rock shaft, and a finger piece connected with said rock-shaft.

65. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl that moves in the same plane as the line spacing wheel, an angular lever connected to said pawl, and a rock shaft that extends fore and aft of the machine and actuates said angular lever.

66. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl that

moves fore and aft of the machine in the same plane as the line spacing wheel, an angular lever to which said pawl is pivoted, and a rock shaft that extends fore and aft of the machine and actuates said angular lever.

67. In a typewriting machine, the combination of a carriage, a platen, a line spacing wheel connected therewith, a line spacing pawl that moves fore and aft of the machine in the same plane as the line spacing wheel, an angular lever pivoted to the carriage and to which said pawl is pivoted, a rock shaft that extends fore and aft of the machine, connections from said rock shaft to said angular lever, and a finger piece on the rock shaft and which effects a line spacing movement of the pawl by a swinging movement of the finger piece from left to right, whereby a single movement of the finger piece will effect a line spacing of the platen and a movement of the carriage to the right to begin a new line of writing.

68. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl that moves in the same plane as the line spacing wheel, an angular lever connected to said pawl, a rock shaft that extends fore and aft of the machine and actuates said angular lever, and an adjustable device on which the pawl bears for determining the extent of line spacing movement to be transmitted to the platen.

69. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl that moves fore and aft of the machine in the same plane as the line spacing wheel, an angular lever to which said pawl is pivoted, a rock shaft that extends fore and aft of the machine and actuates said angular lever, and an adjustable device on which the pawl bears for determining the extent of line spacing movement to be transmitted to the platen.

70. In a typewriting machine, the combination of a carriage, a platen, a line spacing wheel connected therewith, a line spacing pawl that moves fore and aft of the machine in the same plane as the line spacing wheel, an angular lever pivoted to the carriage and to which said pawl is pivoted, a rock shaft that extends fore and aft of the machine, connections from said rock shaft to said angular lever, a finger piece on the rock shaft and which effects a line spacing movement of the pawl by a swinging movement of the finger piece from left to right, whereby a single movement of the finger piece will effect a line spacing of the platen and a movement of the carriage to the right to begin a new line of writing, and an adjustable device on which the pawl bears for determining the extent of line spacing movement to be transmitted to the platen.

71. In a typewriting machine, the combination of a carriage, a platen, a line spacing wheel connected therewith, a line spacing pawl that

nation of a carriage, a platen, a line spacing wheel connected therewith, a lever pivoted to the carriage, a pawl pivoted to said lever, the pivot of the pawl being parallel to the axis of the platen, an adjustable piece that supports the pawl and determines at what part of the movement of the pawl it may engage the line spacing wheel, so as to regulate the extent of line spacing movement to be given the platen, and a rock shaft that transmits movement to said lever.

72. In a typewriting machine, the combination of a carriage, a platen, a line spacing wheel connected therewith, a lever pivoted to the carriage, a substantially horizontally disposed pawl pivoted to said lever, the pivot of the pawl being horizontally disposed, an adjustable device that supports the pawl and determines at what part of the movement of the pawl it may engage the line spacing wheel, so as to regulate the extent of line spacing movement to be given the platen, a rock shaft that extends fore and aft of the machine and transmits movement to said lever, and a finger piece on said rock shaft, a single swinging movement of said finger piece from left to right transmitting a line spacing movement to the pawl and a return of the carriage to the right to begin a new line of writing.

73. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel connected therewith, a line spacing pawl that moves in the same plane as the wheel and co-operates therewith, a rock shaft that extends fore and aft of the machine, an angular extension on said shaft that constitutes a finger piece for turning the shaft, and intermediate mechanism between said pawl and shaft for causing the turning movement of the shaft to effect the movement of the pawl in the general direction of the axis of said shaft, said intermediate mechanism including a universal joint between the parts.

74. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel connected therewith, a line spacing pawl that co-operates with said ratchet

wheel, a rock shaft, a finger piece for actuating said rock shaft, and an intermediate universal joint between the rock shaft and pawl for transmitting a rotary movement of the shaft to the pawl to effect a vibratory movement thereof.

75. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl, a rock shaft that extends fore and aft of the machine, a finger piece for turning said shaft, an angular lever that is actuated by said shaft and moves the pawl, and a universal joint between said angular lever and pawl.

76. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl co-operating with said line spacing wheel, and hand actuated means for actuating said pawl, said hand actuated means comprising a universal joint.

77. In a typewriting machine, the combination of a carriage, a platen that shifts independently thereof, a line spacing wheel connected with the platen, a line spacing pawl co-operating with said wheel, a hand actuated rock shaft, and intermediate connections between the rock shaft and line spacing pawl, said connections comprising means for affording a shifting movement of the platen without affecting the line spacing mechanism.

78. In a typewriting machine, the combination of a carriage, a platen that shifts independently thereof, a line spacing wheel connected with the platen, a line spacing pawl co-operating with said wheel, a hand actuated rock shaft, and intermediate connections between the rock shaft and line spacing pawl, said connections comprising a universal joint and means for affording a shifting movement of the platen without affecting the line spacing mechanism.

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

GEORGE H. SMITH.

Witnesses:

J. M. INGOLD,

AGNES L. McKINNON.