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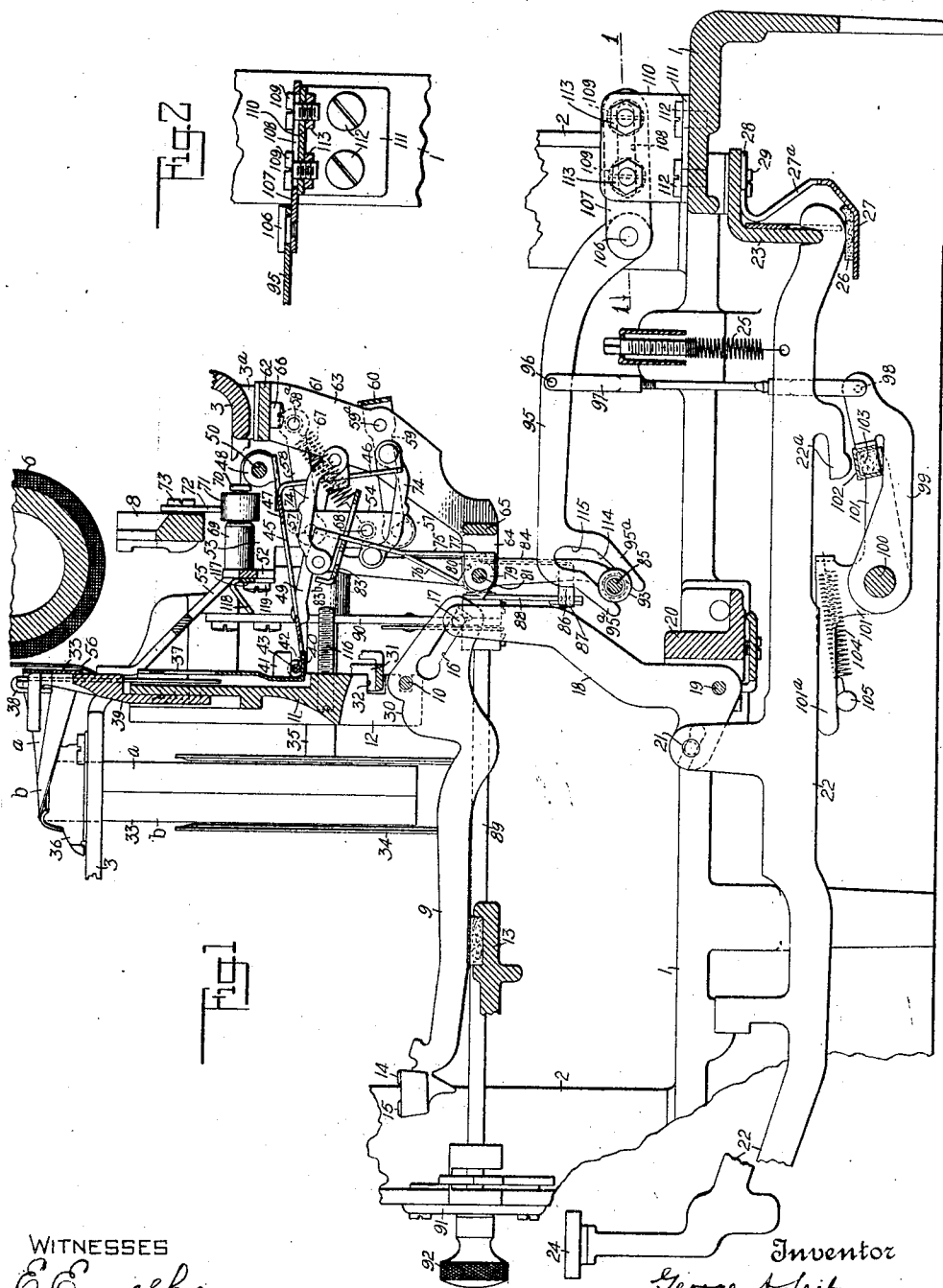
1,490,131

G. A. SEIB

TYPEWRITING MACHINE

Filed Dec. 15, 1921

2 Sheets-Sheet 1



WITNESSES

E. Engelke
mw. Tool

Inventor

George A. Seib

By his Attorney Jacob Fabel

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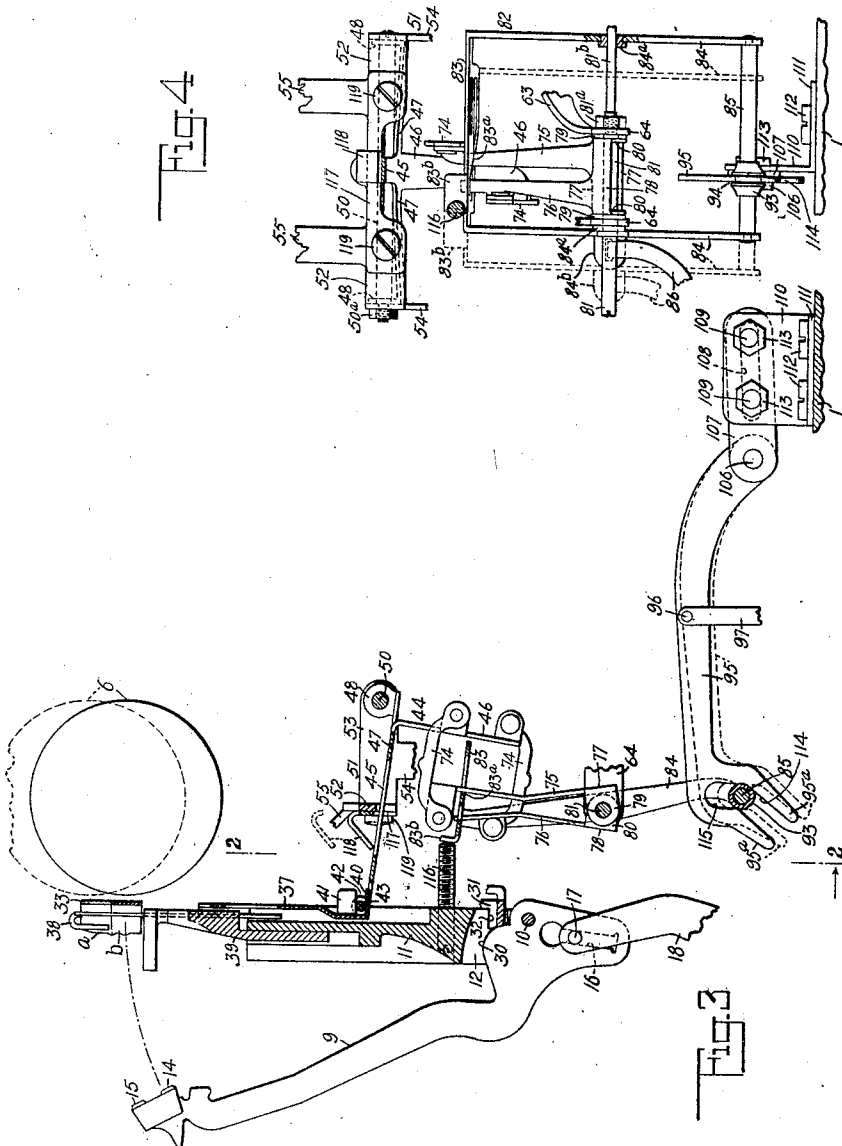
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2 Sheets-Sheet 2



WITNESSES

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Patented Apr. 15, 1924.

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UNITED STATES PATENT OFFICE.

GEORGE A. SEIB, OF ILION, NEW YORK, ASSIGNOR TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPEWRITING MACHINE.

Application filed December 15, 1921. Serial No. 522,505.

To all whom it may concern:

Be it known that I, GEORGE A. SEIB, citizen of the United States, and resident of Ilion, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Typewriting Machines, of which the following is a specification.

My present invention relates to ribbon vibrating mechanism for typewriting machines and its principal object generally stated is to provide new and improved mechanism of the specified character. A specific object of the invention is to improve the ribbon vibrating mechanisms disclosed in my prior Patent No. 1,203,795, granted Nov. 7, 1916, and in the patent of John H. Barr, No. 1,153,668, granted Sept. 14, 1915.

To the above and other ends which will hereinafter appear my present invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter described and particularly pointed out in the claims.

In prior constructions it has frequently happened in doing two-color work that when writing in red or through the lower half or field of the ribbon the first few characters at the beginning of a line will be tipped at their upper portions or tops with black or the color of the upper field. This also has been found likely to occur with the first few characters following the switch or change from black to red or from the upper to the lower ribbon field whenever such switch has been made in the course of the writing, whether at the beginning of a line or not. To cure this and similar defects I introduce in the train of vibrating devices between the printing keys and vibrator a lost motion connection which is so related to the ribbon stop devices that it does not come into play until after the vibrator has been moved to printing position and has been positively arrested in such position by the ribbon stop devices. Thereafter, the lost motion connection allows the actuated printing key to be further depressed until it reaches the bottom of its stroke. In the present instance the lost motion connection is provided by forming an arm or lever member with a slot having a cam portion and a dwell portion, said slot engaging the cross rod of the oscillator or rocking frame. When a printing key is depressed the cam

portion of the slot operates to swing the oscillator and move the vibrator until it is arrested in printing position by the ribbon stop devices, the dwell portion of the slot then becoming effective to enable the arm or lever thereafter to move idly until the end of the key stroke and without affecting the vibrator or the oscillator which will be maintained in operative position by the co-operation of the dwell with the cross rod of the oscillator.

My invention will be more particularly described in connection with the accompanying drawings wherein,

Figure 1 is a front-to-rear vertical sectional view of a No. 10 Remington typewriting machine embodying the preferred form of my invention, said view being taken about centrally and showing only so much of said machine as is necessary to a clear understanding of my invention.

Figure 2 is a fragmentary sectional view taken on a plane indicated by the section line 1-1 in Fig. 1 and looking downward in the direction of the arrow at said line.

Figure 3 is a fragmentary operating view showing the position of the parts when set for red and after the vibrator has been moved to printing position by the cam slot, the printing stroke however not yet being completed.

Figure 4 is a vertical sectional view taken on the section line 2-2 in Fig. 3 and looking in the direction of the arrow at said line.

As appears from Fig. 1 the main frame of the machine comprises a base 1, posts 2 and a top plate 3 that supports guide rails for a platen carriage consisting of a relatively movable truck and platen frame, a platen 6 being mounted on said frame which comprises end bars, not shown, and a connecting cross bar 8. Co-operative with the platen are type bars 9 fulcrumed on a pivot wire 10 supported on a stationary type bar segment 11. The type bars are housed in slots 12 in the segment 11; normally rest on a padded support 13; and have type blocks each with two types 14 and 15. A slot 16 in each type bar is engaged by a pin 17 projecting from a lever 18, the levers 18 being mounted on a pivot wire 19 secured to a bar 20. The levers 18 are pivotally connected at 21 with key levers 22 fulcrumed on a plate 23 secured to the base 1, the upper edges of the key levers being notched to engage with the

rounded bottom edge of the fulcrum plate. Each key lever has a key cap 24 and is provided with a restoring spring 25.

For the purpose of preventing the key levers from becoming accidentally unhooked or displaced from the fulcrum plate 23, I provide a retaining plate 27 formed of sheet metal and extending flatwise transversely of said key levers below their fulcrums. The retaining plate is provided with integral arms 27^a terminating in ears 28 which receive fastening screws 29, said screws being threaded into bosses at the under side of the roof of the base 1 and securing both the fulcrum plate and the retaining plate in place on the frame. In order to prevent the key levers from chattering or striking the metallic retaining plate directly in the course of rapid operation, the upper surface of said plate is preferably faced with a strip 26 of felt or the like. The key levers normally lightly contact with said strip or pad, which reduces noise of operation.

The actuation of any printing key 24 swings the associate type bar 9 into printing contact with the front face of the platen 6 which normally is in lower case position so that the inner or lower case type 14 will print. However, the platen may be shifted upward at will to upper case position by means of the usual shift mechanism of the No. 10 Remington machine, so as to enable the outer or upper case types 15 to print. Each type bar has a contact face 30 that actuates a universal bar 31 housed in a depression 32 in the segment 11, and operative on the usual escapement mechanism.

The types are adapted to print through a ribbon 33 which may be divided longitudinally into two fields or stripes of different characters or colors, such as a black field *a* and a red field *b*. The ribbon is wound on spools 34 mounted on shafts 35 (Fig. 1), which are adapted to be connected alternately to the spring drum, as usual, so as to cause turning movements of the spools and winding on and off of the ribbon. From each spool the ribbon extends upward through an opening in the top plate and over a guide 36 fixed to the top plate, and thence to a vibrator 37, having guide openings formed by the upper end portions of said vibrator and hooks 38 carried thereby. The printing portion of the ribbon extending between the guide openings in the vibrator participates in vibratory movements thereof. A central type guide 39 which is fixedly secured to the front of the segment 11 provides guide ways for the vibrator, the stem whereof terminates in a lip 40, and has rearwardly turned lugs 41. The space 42 between the lugs 41 and the ledge 40 receives a cross pin 43 carried by an operating lever frame 44. The

construction provides a loose pivotal connection between the vibrator and said lever or frame 44 which is made of sheet metal and comprises a horizontally disposed arm 45, a vertically disposed arm 46 and laterally extending arms 47 terminating in perforated ears 48. A diagonal brace 49 connects the arms 45 and 46. The ears 48 fit loosely over a pivot rod 50 carried by a supporting frame or member which is mounted on a stationary bracket and maintained in spring pressed relationship with the carriage in both case positions, participating in case shifting movements of said carriage. Said supporting frame 51 is preferably a single piece and comprises a cross bar 52, side portions 53, having downward extensions 54, and arms 55 inclined upward and forward from the bar 52 and to which is secured the usual device 56 which serves as line gauge and paper guide. The vibrator vibrates between the part 56 and the type guide 39. The pivot rod 50 is supported on the side portions 53, being fixed in place by means of a clamping nut 50^a, one end of said rod being reduced to form a shoulder and threaded to receive said nut which acts to clamp said shoulder against the inner face of the adjacent side portion 53. The downwardly extending portions 54 of said frame carry screw pivots 57 to which are pivoted pairs of parallel links 58 and 59, the lower pair 59 whereof form the sides of a U-shaped bail which further includes a cross bar 60. The links 58 and bail 59, 60 are supported on a casting or bracket 61 comprising a horizontal portion 62, and side portions 63 terminating in forwardly extending portions 64 joined by a web 65, said bracket being secured by screws 66 to bosses 3^a on the top plate 3. The upper pair of links 58 are pivoted on screw pivots 58^a projecting from the sides 63, while the bail 59, 60 is pivoted on lower screw pivots 59^a, thus providing between the frame 51 and the bracket 61 a linkage connection comprising the links 58 and the bail 59, 60, the latter synchronizing movements at the two sides. Coiled draw springs 67 anchored to the screws 58^a and hooked over pins 68 projecting from the sides 54 of the frame 51 constantly urge said frame upward as a whole. The cross bar 52 is provided with a lug 69 carrying a pin 70 on which is mounted a roller 71 which engages with the under side of a stop bar or blade 72 extending along the rear of the carriage frame bar 8 and secured thereto by screws 73. The springs 67 constantly maintain the roller 71 engaged with the bar 72, said bar running over said roller during the carriage travel. Also, when the platen is shifted to upper case, causing the bar 72 to rise, the roller will continue in con-

tact with it due to the spring pressure, and the supporting frame 51 will move upward on its linkage, carrying with it the pivot rod 50 which in turn will carry or shift 5 bodily upward the operating lever 44 and the ribbon vibrator 37 so that their normal relationship to the platen will remain the same in upper case position as in lower case. The lever arm 46 is connected by 10 links 74 with the upper arms of actuators 75 and 76 which have cross portions 77 and 78 terminating in ears 79 and 80 perforated to fit over a pivot rod 81 which is fixed to the extensions 64 of the bracket 61. The 15 actuators are loosely confined between said extensions so that they cannot move endwise of the pivot rod 81 but may turn freely thereon. Said rod projects outwardly beyond the extensions 64, one of the extended portions of the rod being 20 reduced to form a shoulder and threaded to receive a clamping nut 81^a (Fig. 4) which co-operates with said shoulder to clamp the rod to the contiguous extension 25 or ear 64. Beyond its threaded portion, the rod 81 has another reduced portion 81^b, made smooth to support one side of a rectangular rocking frame or oscillator 82, the body of the rod 81 supporting the 30 rocking frame at its opposite side. Said rocking frame or oscillator 82 comprises a head 83 and side portions 84 connected by a cross rod or bar 85. The side portions 84 have bushings 84^a which bear on the pivot rod 81, said oscillator being adapted not only to rock on said rod and vibrate the ribbon but also to be slid lengthwise of said rod to change ribbon fields. The cross 35 head or bar 83 is cut out to provide a narrow portion or throat 83^a which is adapted to receive the actuators 75 and 76 and communicate effective movements thereto. When one actuator is in the throat the other actuator is ineffective, and vice versa. For 40 mimeographing or similar purposes the oscillator may be moved to a position where neither of the actuators engages in said throat. The actuator 75 communicates longer movements or throws to the operating lever 44 than the actuator 76 for the 45 reason that the upper link 74 which connects the actuator 75 with the lever arm 46 acts further from the common pivotal center 81 than does link 74 of actuator 76; and 50 also because said upper link is connected to the operating lever 44 closer to its center of movement 50 than is the lower link 74. The parts are so constructed and adjusted that when the actuator 75 is engaged in the 55 throat 83^a, the oscillator 82 will operate through said actuator to transmit movement to the upper link 74, operating lever 44 and vibrator 37 sufficient to raise the lower or red field *b* of the ribbon to cover 60 the printing point. This adjustment of the

parts is illustrated in Fig. 4 which shows the actuator 75 effectively related to the oscillator 82, the actuator 76 being idle. When the actuator 76 is operative the parts 70 will lift the vibrator and ribbon to a lesser extent so as to present the upper ribbon field *a* opposite the printing point. During case shifting movements the links 74 will swing about their pivotal connections with their associate actuators as fixed 75 centers.

Sliding movements of the oscillator 82 lengthwise of and on the rod 81 to change ribbon fields are effected at will by a train of devices comprising a perforated ear 84^b 80 (Fig. 4) on the left-hand side portion 84 in which ear is hooked loosely the inner end of a connecting link 86. The link curves downward and leftward and at its left-hand end is offset forward being 85 pivotally connected at 87 with a crank arm 88 fixed to the rear end of a horizontal rock shaft 89, bearing in hangers or supports 90 and 91 and provided with a finger button 92 (Fig. 1). Rocking movements 90 of the shaft are transmitted through the crank arm 88 and link 86 to the oscillator 82 which may thus be slid from the full line or red field position in Fig. 4 to the 95 dotted line or black field position, or may further be moved leftward to mimeograph position. The usual or other suitable indicating, stop and detent devices are provided in connection with the ribbon field-changing rock shaft 89 and button 92 to 100 indicate the ribbon field, to positively arrest the parts and to maintain them set in arrested positions.

Referring now to the means for transmitting the actuating movements of the 105 printing key levers 22 to the oscillator 82, there is supported on the cross rod 85 of the oscillator a sleeve or spool 93 formed with a groove 94 for co-operation with a member or part with which my present invention is more particularly concerned. 110 Said member is in the form of a pivoted arm or lever 95 which will hereinafter be described in detail. The arm 95 has pivotally connected to it between its ends at 96 the 115 upper end of a link 97, the lower end of said link being pivotally connected at 98 with an arm 99 arranged about centrally of the machine and pivoted on a cross rod 100 secured at its ends in the sides of the base. 120 The arm 99 is comprised in a universal bar frame which further includes side arms 101 pivotally supported on the cross rod 100 near its ends, the side arms 101 and the 125 central arm 99 being connected by a universal bar which is in the form of an inverted trough or channel bar 102 which may be made of sheet metal and suitably secured to projections on the arms 99 and 101, the interior of the channel or trough 130

being filled or stuffed with suitable material indicated at 103 such as felt or the like. The key levers 22 are provided at their under sides with tongues 22^a which are adapted to co-operate with the top of the universal bar 102 and swing the universal bar frame down on its pivotal axis 100, thus pulling down the link 97 and actuating the arm 95 to vibrate the ribbon as hereinafter described. It will be observed that the ribbon universal bar 102 is distinct from the escapement universal bar 31. One of the side arms 101 is preferably provided with a tail or extension 101^a and has hooked to it above the pivotal axis 100 one end of a coiled spring 104 which is anchored to a fixed pin 105 projecting inward from the adjacent side of the base 1, said spring operating to maintain the tail portion 101^a of said arm 101 normally in contact with said pin 105, and assisting to restore the universal bar frame and connected parts to normal position after operation.

The arm 95 is horizontally disposed as shown in Fig. 1 and its rear end is perforated to bear on a shouldered rivet or pivot 106 which, as appears from Figs. 1 and 2, is secured to the forward end of a supporting arm 107. Said arm 107 is formed with a longitudinally extending slot indicated at 108 which receives headed securing screws 109, said screws passing freely through the slot 108 near its ends and engaging in threaded holes formed in the upright portion 110 of an angular bracket which further comprises a horizontal portion 111 which seats on the top or outside of the roof of the rear of the base 1 and is secured thereto by headed screws 112. The shanks of the screws 109 receive clamping nuts 113 which co-operate with the heads of the screws to clamp the arm or slidably mounted bearing plate 107 in adjusted relationship with the bracket 110, 111. As will be seen from Fig. 1 the slot 108 is slightly inclined, so that by loosening the nuts 113 and screws 109 the arm or slide 107 may be freed and slid backward and forward at a slight inclination to the horizontal. The construction is such that when the slide is moved forward the pivotal axis 106 is also slightly lowered, while when the slide is moved rearward on its supporting bracket the pivotal axis 106 will not only be moved rearward correspondingly but will also be slightly raised. It will thus be seen that provision is made for adjusting the axis about which the arm 95 is adapted to turn, both in a fore-and-aft and also in an up and down or vertical direction. The link 97 is made in a plurality of parts that are relatively adjustable, enabling the link to be lengthened or shortened as desired so as properly to connect the lever member 95 with the universal bar 102. The point of connection 96 of the link 97 with the lever

95 is forward of the lever fulcrum 106, and between it and the front or operating end of the lever. The front end of the lever 95 is provided with a head or enlargement which is formed with an open-mouthed slot or cut-out comprising two parts or portions, an inclined or cam portion indicated at 114, which at its upper end merges into a dwell portion indicated at 115. The dwell portion 115 is preferably arcuate, its edges being struck on curves having the pivotal axis 106 as a center. The inclined slot portion 114 which acts as a cam or actuating portion is inclined upward and rearward from its mouth or lower end to its junction with the dwell portion, providing narrow strips or fingers 95^a at opposite sides of the slot 114, 115. The stock of the slotted lever or arm 95 is of such thickness that it may fit loosely in the groove 94 in the sleeve 93, and the width of the slot 114 is such that the fingers 95^a are confined between the inner walls of said groove. The construction is such that the sleeve 93 is retained always in cooperation with the cam slot whatever the endwise position of the oscillator 82, the rod 85 sliding back and forth through the sleeve when the oscillator is shifted to change ribbon fields.

When a printing key lever is depressed, causing the link 97 to pull down the lever 95 on its pivot or fulcrum 106, the upper inclined edge of the cam slot 114, acting on the cross rod 85 through the sleeve 93, will force said rod rearward, causing the oscillator 82 to turn on its fulcrum so that the actuating device or throat portion 83^a at its top will move forward and operate the engaged one of the actuators 75 and 76, causing such actuator to operate the lever 44 and lift or raise the vibrator 37 to printing position. Movement of the parts will continue until the lever 95 has been swung downward far enough to carry the cam slot 114 past the sleeve 93, a position illustrated in full lines in Fig. 3. Assuming the parts are set for red, this movement will present the lower ribbon field *b* opposite the printing point. This position of the parts is reached and the vibratory movement of the ribbon completed before the printing key lever is fully depressed, and during the further depression of the key lever and until it reaches the bottom of its stroke the dwell portion 115 of the slot will cooperate with the sleeve, sliding down over it. However, since this dwell portion is concentric with the lever 95 it will not affect the rod 85 or the oscillator 82 which, together with the operating lever 44 and the ribbon vibrator, will remain motionless until the end of the key stroke. In other words, after the lever 95 has moved the oscillator to complete the ribbon throw, the lost motion connection becomes effective.

One of the important features of my present invention is that my improved vibrator actuating means does not prevent or interfere with the normal and proper operation of the vibrator arresting means or ribbon stop devices. As heretofore provided in the No. 10 Remington machine said ribbon stop devices comprise a stop device in the form of a screw 116 which is threaded horizontally rearward through the lower portion of the segment 11, and adjusted so that its rear end or point may serve as an abutment or stop for the oscillator 82. Since the segment 11 is non-shiftable the stop 116 will also be non-shiftable. For stopping purposes in co-operation with the stop 116 the front edge of the head 83 is provided with an up-turned tab 83^b which is of such width that some portion of its front face is opposite the screw stop 116 in both the black and red shift positions of the oscillator. This will be understood from Fig. 4 which shows in full lines the left-hand side portion of the stop or tab 83^b opposite the screw stop 116 so that said screw stop will arrest the forward swing of the oscillator when the parts are set for red; while as appears from the dotted lines in Fig. 4 the right-hand side of the front face of the stop device 83^b will contact with the stop 116 to arrest the oscillator 82 when it is set to oscillate for the black or the upper field of the ribbon. To insure against overthrow especially when the lower ribbon is in use an additional stop device is provided, this being interposed between the vibrator and the stop 116 and in position to co-operate directly with the operating lever frame 44. This additional stop device is preferably made of sheet metal and comprises a cross portion 117 (Fig. 4) from the top of which projects a central tongue 118 which is bent or inclined forward and downward terminating in a stop face or edge. The stop device 117, 118 is secured by screws 119 to the front of the cross portion 52 of the supporting frame 51 and so that it may shift up and down with said frame during platen shifting operation. The under side of the part 117 is cut out in correspondence with the usual cutout in the cross portion 52 so as not to prevent or interfere with the vibratory movements of the operating lever 44. The tongue or stop device proper 118 overlies the arm 45 of said lever, said arm being adapted to contact with the end or edge of the tongue when said lever has been thrown upward to its greatest extent, that is, when the red or lower ribbon field is in use. The stops 116 and 118 are so adjusted relatively that they are adapted for use simultaneously when the vibrator receives its highest throw. In other words, when the stop device 83^b contacts with the

stop 116 to arrest the parts the lever arm 45 is contiguous to or touching the end of the stop 118 as will be understood from Fig. 3. It will be understood that when the upper ribbon field *a* is in use the stop 118 will not come into play as the swing of the operating lever does not carry the arm 45 high enough to bring it into contact with the stop 118. At such times, only the lower or non-shiftable stop 116 is effective to arrest the vibrating train, said stop 116, as has been stated, being employed to arrest the oscillator both for the long and short throws or vibratory movements of the ribbon. The oscillator, of course, has a constant swing or throw, the variation of ribbon throw being due to the variable throw communicated to the operating lever by the actuators 75 and 76.

It will be understood that the lever 95 is so adjusted that it reaches the end of its operative movement and brings the lower end of the dwell 115 or ineffective portion into position for use simultaneously with the contact of the stop device 83^b with the stop 116 so that said stop device will remain in effective engagement during the latter portion of the down swing of the actuating lever 95 when the dwell is engaging the sleeve 93. It will be apparent that by the use of my present invention a considerable latitude of adjustment is afforded and this is of great practical advantage. In prior constructions where there was no lost motion connection provided in the actuating train the use of the ribbon stop devices required a comparatively fine adjustment of the individual printing key levers relative to the ribbon universal bar, the tongues 22^a being bent or set one at a time so that each was adapted to give substantially the same extent of movement to the vibrating train, as otherwise the actuation of some key levers would bring the stop devices 83^b and 116 into contact and arrest the vibrating train before the key strokes were fully completed; in other words, there would result an unevenness in the key strokes unless the individual key levers were adjusted with care relative to the ribbon universal bar. Such fine adjustments are not required with my improvements since the lost motion connection between two of the members or parts of the vibrating train takes care of any inequalities of adjustment. Furthermore, my invention is of advantage in avoiding torsion or strain on the universal bar, which has resulted in prior constructions from its abrupt arrest before the completion of the key strokes, the continued downward pressure on the keys after such arrest tending to strain and twist the bar. Moreover, it has been found in practice that the defects hereinbefore referred to, due to the failure of the vibrator to be thrown up far enough ini-

tially when printing from the lower field is begun, resulting in tipping of the first one or more characters with the color of the upper field, are obviated by the use of my present invention, said invention enabling each type impression to be made entirely from the particular ribbon field which is in use, this being largely due to the fact that the ribbon is raised promptly to its full extent and before the type bar has reached a printing position. This will be fully apparent from an inspection of Fig. 3. Also, since the ribbon will be brought to the printing position and arrested before the type bar reaches the printing point, the printing will take place through a motionless ribbon conducing to clearness of impression. Furthermore, any shock on the fingers of the operator, such as might occur in prior constructions when the ribbon stop devices arrested the ribbon universal bar and the key lever before the latter had reached the bottom of its stroke, is avoided by the use of my present invention, and any kick-back or re-action of the oscillator resulting from the contact of its stop 83^b with the stop 116 will be prevented by the front side of the dwell portion 115 of the slot in the cam slot lever 95.

Various changes may be made without departing from my invention.

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

1. In a typewriting machine, the combination of a platen, a ribbon vibrator, printing keys, operative connections between said printing keys and said vibrator, each printing key being effective before the completion of its stroke to move said vibrator to position to cause the ribbon to cover the printing point, and means separate from said operative connections to prevent overthrow of said vibrator during the completion of the key stroke.

2. In a typewriting machine, the combination of a platen, a ribbon vibrator, printing keys, operative connections between said printing keys and said vibrator, each printing key being effective before the completion of its stroke to move said vibrator to position to cause the ribbon to cover the printing point, and a stationary stop co-operative with said connections to prevent movement of said vibrator during the completion of the key stroke.

3. In ribbon vibrating mechanism for typewriting machines, the combination of a ribbon vibrator; a train of key operated actuating devices connected thereto and comprising a lever provided with a slot having a cam portion and a dwell portion; and ribbon stopping means that becomes effective when the dwell portion of said slot comes into use.

4. In ribbon vibrating mechanism for

typewriting machines, the combination of a ribbon vibrator; a train of key operated actuating devices connected thereto and comprising a lever provided with a slot having a cam portion and a dwell portion; and a ribbon stop co-operative with one of the elements of said train at the end of the throw caused by said cam portion, said dwell portion maintaining said element contactive with said ribbon stop.

5. In a typewriting machine, the combination of a platen, a ribbon vibrator, a universal bar, a train of connections between said vibrator and said universal bar, said train including two elements having a lost motion connection with each other, printing key levers operative on said universal bar, and a stop for arresting said vibrator after it has reached the printing position and before the completion of the key stroke.

6. In a typewriting machine, the combination of a platen, a ribbon vibrator, a universal bar, a train of connections between said vibrator and said universal bar, said train including two elements having a lost motion connection with each other, printing key levers operative on said universal bar, and a stop for arresting said vibrator after it has reached the printing position and before the completion of the key stroke, said lost motion connection becoming effective only after the arrest of said vibrator by said stop.

7. In a typewriting machine, the combination of a platen, a ribbon vibrator, a universal bar, a train of connections between said vibrator and said universal bar, said train including two pivoted members, one provided with a slot and the other with a portion engaging in said slot, printing key levers operative on said universal bar, and a stop for arresting said vibrator after it has reached the printing position and before the completion of the key stroke.

8. In a typewriting machine, the combination of a platen, a ribbon vibrator, a universal bar, a train of connections between said vibrator and said universal bar, said train including two pivoted members, one provided with a slot and the other with a portion engaging in said slot, printing key levers operative on said universal bar, a stop for arresting said vibrator after it has reached the printing position and before the completion of the key stroke, and a second stop arranged between said vibrator and said first recited stop, said second stop preventing overthrow of said vibrator.

9. In a typewriting machine, the combination of a platen, a ribbon vibrator, connections thereto comprising a member provided with a pin, a key lever, a pivoted arm operated by said key lever and provided with a slot having a cam portion concentric with said pivot and a connected dwell portion,

said slot co-operating with said pin, and ribbon stop devices becoming effective when said dwell portion engages with said pin.

10. In a typewriting machine, the combination of a platen, a ribbon vibrator, a train of key operated actuating devices connected thereto and comprising a pivoted arm having an actuating slot, a stationary support on which said arm is pivoted, and means for affording adjustment of said stationary support.

11. In a typewriting machine, the combination of a platen; a ribbon vibrator; a train of key operated actuating devices connected thereto and comprising a pivoted arm having an actuating slot; a stationary supporting arm on which said first recited arm is pivoted, said stationary arm being provided with an elongated slot; a stationary bracket; a pair of securing screws passing through said elongated slot; and nuts co-operating with said screws to clamp said stationary arm adjustably in place on said bracket.

12. In a typewriting machine, the combination of a platen; a ribbon vibrator; a train of key operated actuating devices connected thereto and comprising a pivoted arm having an actuating cam; a stationary supporting arm on which said first recited arm is pivoted, said stationary arm being provided with an inclined slot; and means for adjustably securing said stationary arm to the frame of the machine, said stationary arm when adjusted varying the position of the pivot of said first recited arm in a direction fore-and-aft of the machine and also in an up-and-down direction.

13. In a typewriting machine, the combination of a platen; a ribbon vibrator; a frame connected to said vibrator, said frame being pivoted to swing fore-and-aft of the machine and being provided with a cross bar; printing keys; and a pivoted arm adapted to be swung in an up-and-down direction by said printing keys, said arm being provided with a cam operative on said cross bar and with a dwell portion co-operative also with said cross bar.

14. In a typewriting machine, the combination of a platen; a ribbon vibrator; a pair of operating levers connected with said vibrator and adapted to move it different extents, a shiftable frame for operating said levers in alternation, said frame being pivoted to swing fore-and-aft of the machine and being provided with a cross bar; printing keys; and a pivoted arm adapted to be swung in an up-and-down direction by said printing keys, said arm being provided with a cam slot operative on said cross bar, said cam slot terminating in a dwell.

15. In a typewriting machine, the combination of a ribbon vibrator, an oscillator,

connections between said vibrator and said oscillator, a stop for said oscillator, a key actuated lever to operate said oscillator, and means for enabling said lever to have an idle movement under the key depression after said oscillator has been moved into contact with said stop.

16. In a typewriting machine, the combination of a ribbon vibrator, means including an oscillator for varying the throw of the ribbon so as to print through either the upper or lower half thereof, a stop for the vibrator when said means is set for using the lower half of the ribbon, a stop for said oscillator, a key actuated lever for operating said oscillator, and means for enabling said lever to have an idle movement under the key depression after said oscillator has been moved into contact with its stop.

17. In a typewriting machine, the combination of a shiftable platen, a ribbon vibrator, a universal bar, a train of connections between said vibrator and said universal bar, said train including two pivoted members, one having a slot engaging with the other member, part of said train being shiftable with said platen, printing key levers operative on said universal bar, a stop for arresting said vibrator after it has reached the printing position and before the completion of the key stroke, and a second stop arranged between said vibrator and said first recited stop and shiftable with said platen, said second stop preventing overthrow of said vibrator.

18. In a typewriting machine, the combination of a shiftable platen, a ribbon vibrator shiftable with said platen, a train of key operated actuating devices for said vibrator including two devices having a lost motion connection, throw-varying devices, and a pair of ribbon stops, one shiftable with said platen and the other having an unvarying normal position for both case positions of said platen, one of said stops being effective for both extents of ribbon vibrating movement and the other of said stops being effective for only one extent of vibrating movement.

19. In a typewriting machine, the combination of key levers, a fulcrum overlying said key levers, springs urging said key levers into engagement with said fulcrum, a retaining plate extending transversely of and beneath said key levers, and a pad on said plate with which the under edges of said key levers are adapted to contact.

20. In a typewriting machine, the combination of a ribbon vibrator, a plurality of key operated actuators constantly connected thereto, a settable device for rendering said actuators separately effective to vary the throw of the vibrator, and key

operated means for actuating said device, said means operating to communicate an unvarying throw to said device and to insure the completion of said throw before the
5 end of the key stroke.

21. In a typewriting machine, the combination of a ribbon vibrator, a plurality of key operated actuators constantly connected thereto, a settable device for rendering
10 said actuators separately effective to vary the throw of the vibrator, key operated means for actuating said device, said means operating to communicate an unvarying throw to said device and to insure the completion of said throw before the end of the
15 key stroke, and a stop for arresting said device at the end of its unvarying throw.

22. In a typewriting machine, the combination of a ribbon vibrator, an operating
20 lever connected therewith, two levers connected to said operating lever, means for rendering said two levers separately effective, said means comprising a settable lever frame, and key operated means for rocking
25 said lever frame to a constant extent and for insuring the completion of the rocking movement of said frame before the end of the key stroke.

23. In a typewriting machine, the combination of a ribbon vibrator, an operating
30 lever connected therewith, two levers connected to said operating lever, means for rendering said two levers separately effective, said means comprising a settable lever frame, key operated means for rocking said
35 lever frame to an unvarying extent and for insuring the completion of the rocking movement of said frame before the end of the key stroke, and a stop co-operative with
40 said rocking frame to arrest it always at the same point.

24. In a typewriting machine, the combination of a ribbon vibrator, two actuators constantly connected therewith, a lever
45 frame pivoted between its ends and at one end loosely embracing said actuators, and a key operated arm provided with a cam portion and a dwell portion, said portions being adapted to co-operate with the other end
50 of said lever frame.

25. In a typewriting machine, the combination of a ribbon vibrator, two actuators constantly connected therewith, a lever
frame pivoted between its ends and at one end loosely embracing said actuators, a key
55 operated arm provided with a cam portion and a dwell portion that are adapted to co-operate with the other end of said lever

frame, and a fixed stop adapted to arrest said lever frame at the end of its throw.

26. In a typewriting machine, the combination of a ribbon vibrator, a train of key operated actuating devices connected thereto including a cam lever arm having a constant throw, and a pair of ribbon stops, one of said stops having a fixed normal relationship with said train and the other of said stops having a variable normal relationship with said train but being always
60 in effective position relative to said train.

27. In a typewriting machine, the combination of a ribbon vibrator, a train of key actuated operating devices including a lever provided with an actuating cam having a constant throw, throw-varying devices operative independently of said cam lever, and a pair of ribbon stops, one of said stops being effective for both extents of ribbon vibrating movement and the other of said stops being effective for only one extent of
70 vibrating movement.

28. In a typewriting machine, the combination of a ribbon vibrator, a train of key operated actuating devices connected thereto including a lever arm provided with an
85 actuating cam having a constant throw, throw-varying devices independent of said lever arm, and a pair of ribbon stops, one shiftably settable with said throw-varying devices and the other having a fixed normal
90 position relative to the actuating devices.

29. In a typewriting machine, the combination of a ribbon vibrator, a train of key operated actuating devices including a lever arm provided with an operating cam, throw-varying devices settable independently of
95 said cam lever, and a pair of ribbon stops, both of said stops being operative to limit one extent of vibrating movement, the other extent of vibrating movement being limited
100 by one only of said stops.

30. In a typewriting machine, the combination of a ribbon vibrator, a key operated lever provided with an actuating cam, a train of devices operative by said cam and
105 connected to said vibrator, and a plurality of stop members, one stop member co-operating with one element of said train to arrest it positively at the limit of its movement and the other stop member co-operating
110 with another element of said train to prevent over-throw of said vibrator.

Signed at Ilion, in the county of Herkimer, and State of New York, this 12th day of December, A. D. 1921.

GEORGE A. SEIB.