

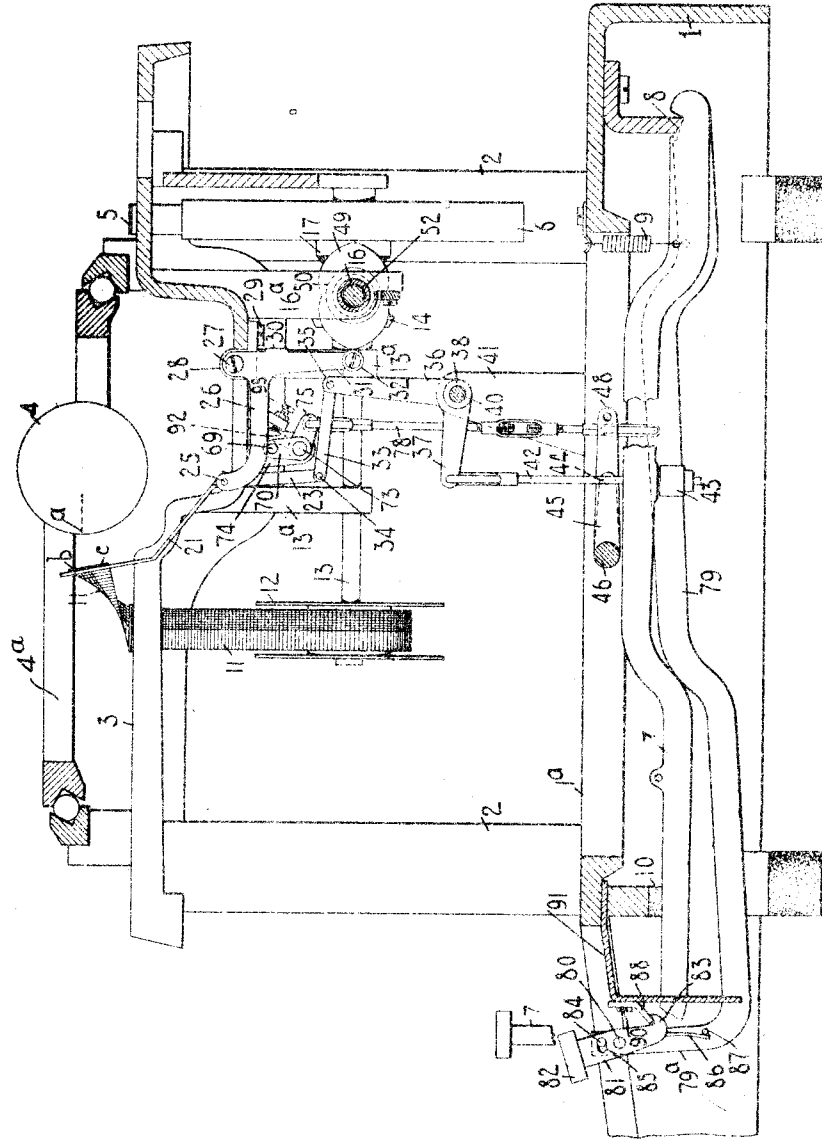
1,087,990.

G. H. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED JAN 10, 1910.

Patented Feb. 24, 1914.

4 SHEETS-SHEET 1.

FIG. 1.



WITNESSES:

E. M. Wells
Wm. Pool

INVENTOR.

George H. Smith
By Jacobus

HIS ATTORNEY

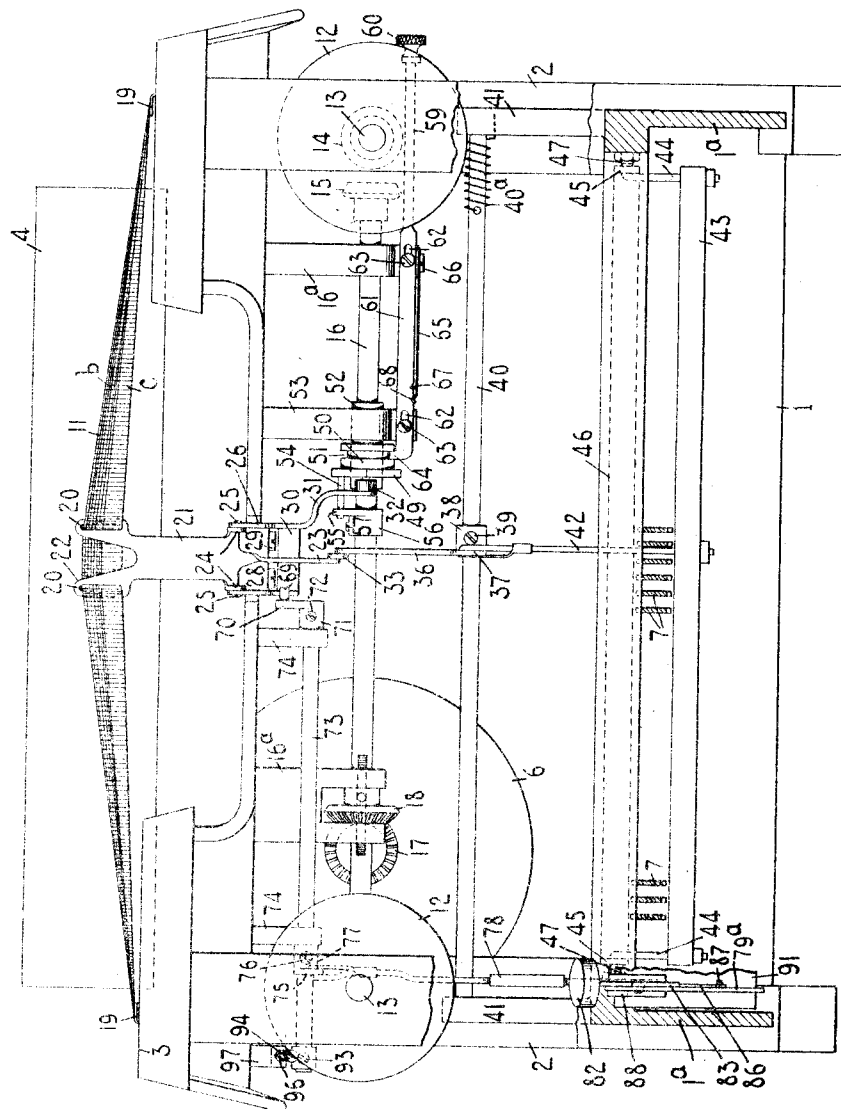
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4 SHEETS—SHEET 2.

FIG. 2.



WITNESSES.

E. M. Wells.
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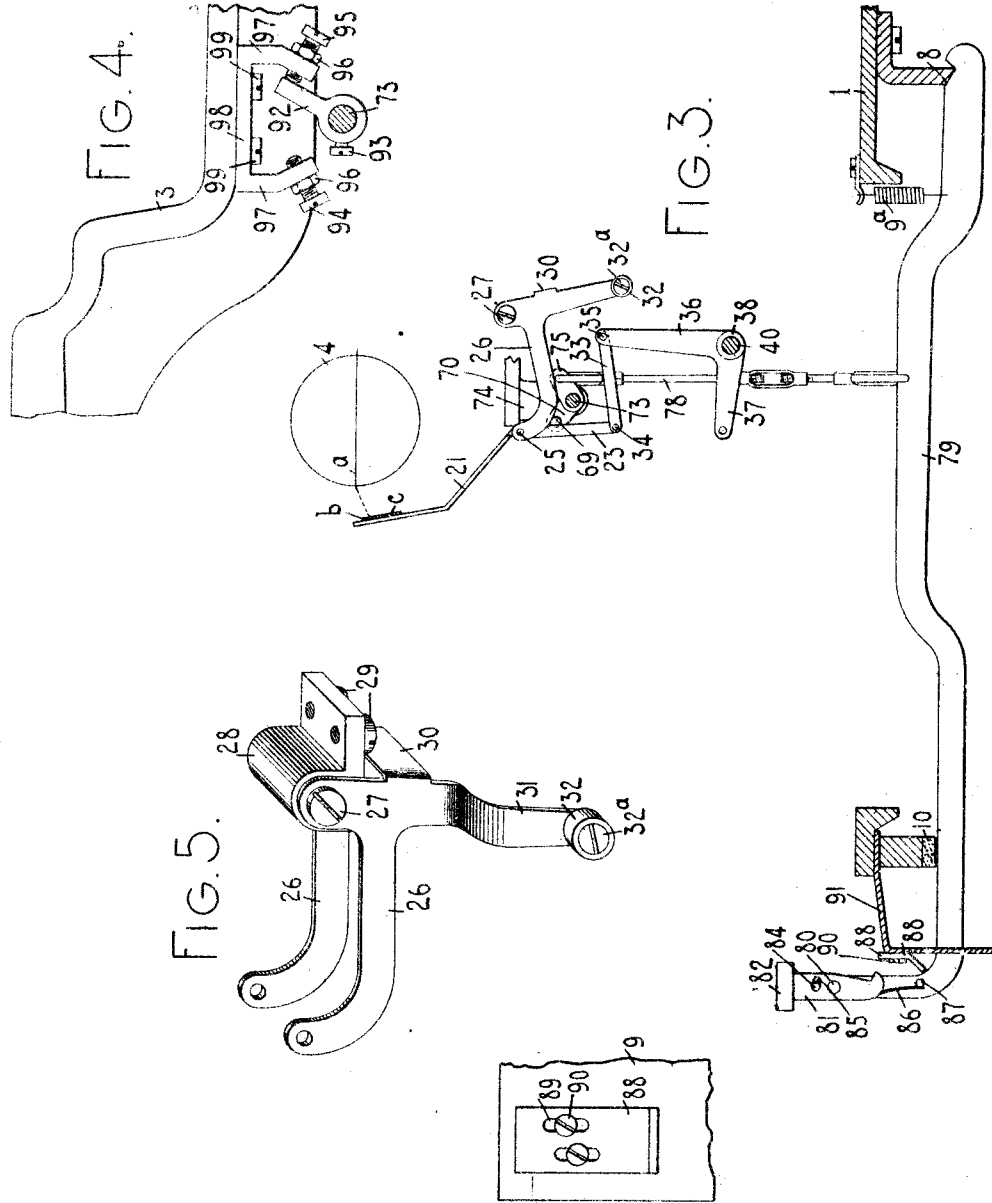
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1,087,990.

Patented Feb. 24, 1914.

4 SHEETS—SHEET 3.



WITNESSES:

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FIG. 6.

INVENTOR

George H. Smith

By Jacob F. Hill

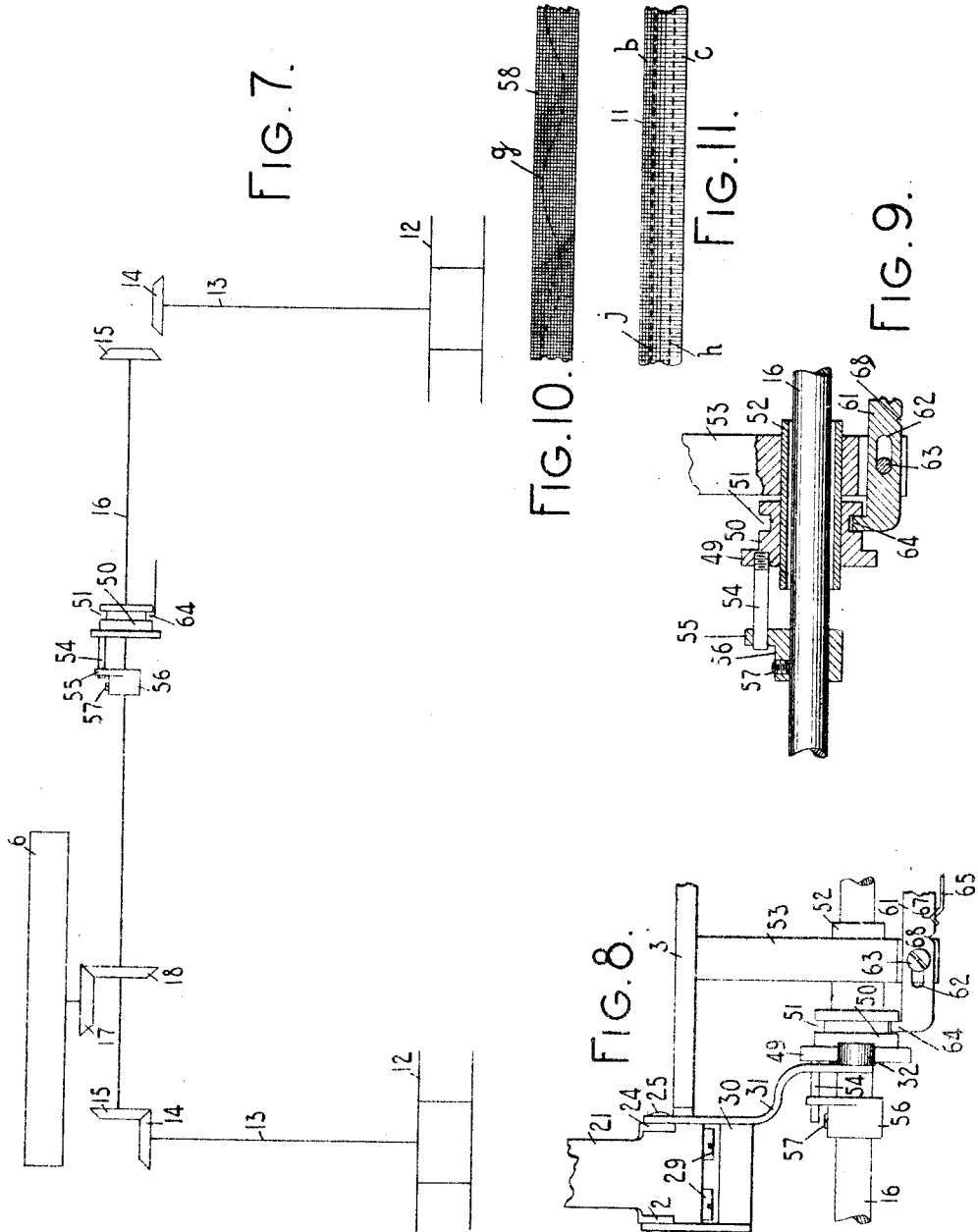
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4 SHEETS—SHEET 4.



WITNESSES.

E. M. Wells.
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UNITED STATES PATENT OFFICE.

GEORGE H. SMITH, OF NUTLEY, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,087,990.

Specification of Letters Patent.

Patented Feb. 24, 1914.

Application filed January 10, 1910. Serial No. 537,170.

To all whom it may concern:

Be it known that I, GEORGE H. SMITH, citizen of the United States, and resident of Nutley, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to ribbon mechanism for typewriting machines and the general object of said invention is to provide improved devices of the class specified.

More specifically one of the objects of my invention is to provide simple and efficient means for enabling a ribbon to be used substantially throughout its width and particularly in a visible writing machine where the ribbon is vibrated toward and away from the printing point at printing operation.

Another object is to provide means for dispensing with the means for cross feeding the ribbon or varying its throw automatically and to provide hand controlled means for setting the ribbon in one or another of a plurality of predetermined positions so as to enable predetermined widthwise portions of the ribbon to be made use of.

Other specific objects will hereinafter appear.

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

In the accompanying drawings which illustrate one form of my invention, Figure 1 is a fragmentary vertical central view taken fore and aft of a typewriting machine embodying my invention, only so much of the machine as is necessary to a clear understanding of my invention being disclosed. Fig. 2 is a front elevation of the machine, parts being in section, and other parts being omitted and broken away. Fig. 3 is a skeleton view showing various parts of the ribbon mechanism in side elevation, said parts being shown in different relationship from that in which they appear in Fig. 1. Fig. 4 is a fragmentary side view partly in section showing stop devices hereinafter more specifically referred to. Fig. 5 is a perspective view of a ribbon carrier supporting device or frame and the element on which the same is mounted. Fig. 6 is a frag-

mentary front view of a locking element or plate coöperative with a ribbon controlling key, the support of said element also being shown. Fig. 7 is a diagrammatic plan view of the mechanism for feeding the ribbon longitudinally. Fig. 8 is an enlarged fragmentary front view showing parts of the ribbon vibrating mechanism and devices for controlling the same, said parts and devices appearing in different relationship from that shown in Fig. 2. Fig. 9 is a vertical sectional view of certain of the devices shown in Fig. 8. Figs. 10 and 11 are fragmentary face views of ribbons, said views illustrating paths which may be followed by the types along the ribbons at different times.

Referring first to Figs. 1 and 2, the main frame of the machine is shown as comprising a base 1, corner posts 2 and a top plate 3. A platen 4 is mounted in a suitable carriage 4^a, said carriage being connected by a band or strap 5 with a power device or spring drum 6 pivoted on the frame of the machine. The step-by-step movements of the carriage are controlled by suitable feeding devices (not shown). Type bars (not shown) are adapted to coöperate with the front face of the platen, said type bars being actuated by key levers 7 fulcrumed at 8 in the rear of the base, each key lever being provided with a restoring spring 9 which normally maintains the lever in contact with a cushion 10 as shown in Fig. 1. A ribbon 11 is wound on ribbon spools 12, the ribbon spools being vertically disposed one at each side of the machine and below the top plate. The ribbon spools are mounted each on a horizontal rearwardly extending shaft 13, said shaft bearing in lugs 13^a depending from the top plate 3 and as shown in Figs. 1, 2 and 7 carrying at its rear a beveled pinion 14 which is adapted to mesh with a beveled pinion 15, the two pinions 15 being mounted at the ends of a power or ribbon driving shaft 16 which is rotatively and slidably supported in brackets or lugs 16^a depending from the top plate. Said power or driving shaft is adapted to receive rotary motion from the spring drum 6 during step-by-step feeding movements of the carriage through connections which include beveled pinions 17 and 18. The pinion 17 is connected with the spring drum and the pinion 18 which constantly meshes with the pinion

17 has a pin and slot connection with the driving shaft 16 which permits endwise movement of the shaft relatively to the pinion but compels said shaft to participate in rotary movements of said pinion. It will be understood that the driving shaft 16 is movable endwise to and fro so as to effect alternate engagement between the beveled pinions 15 and their associate pinions 14, enabling the ribbon spools 12 to be turned in alternation to wind the ribbon thereon. The ribbon 11 is led upward from each spool through an opening in the top plate and thence turns horizontally inward, being guided by curved guides 19. Midway between the guides 19 the ribbon is threaded through slots 20 formed in the head or upper portion of a vibratory ribbon vibrator 21, the vibrator being cut away between the slots as indicated at 22 to provide an opening through which the types may cooperate with the paper and platen through the ribbon. The vibrator has a downward extension or stem 23 which is bent or twisted at right angles to the body of the vibrator and so that said stem is in a fore and aft plane. Ears 24 are bent forward from the lower portion of the body 21 of the vibrator, said ears receiving pivotal connections 25 which pivotally support the vibrator on a supporting or lever member which is best shown in Figs. 2 and 5. Said supporting member or frame comprises a pair of parallel horizontal arms 26, said arms curving upward at their forward ends and receiving the pivots 25 and extending upward at their rear ends to receive pivot screws 27 by which the supporting member or lever frame is pivotally attached to a block 28, said block being secured by screws 29 to the top plate 3. The arms 26 are connected at the rear by a cross arm 30 and the right-hand arm is provided with a downward extension 31, said extension being off-set outwardly as best shown in Fig. 2 and carrying at its lower end a device or roller 32 rotatable on a screw pin 32^a. As hereinafter described the roller 32 is adapted to cooperate with devices for automatically varying the position of the supporting member and the vibrator which it carries, thus providing for the cross feed of the ribbon. As will be best understood from Fig. 1, the vibrator normally maintains the printing portion of the ribbon, or that portion which crosses the opening 22, in front of and opposite the printing point *a* on the front face of the platen but separated from and forward of said printing point so that normally the printing point is visible to the operator. Means are provided for swinging the vibrator substantially radially of the platen as distinguished from a movement tangential of the platen, and backward toward the platen so as to bring the ribbon in close proximity to the printing face of the platen to receive the impact of the types at printing operations. The swinging or vibrating means for the ribbon are under the control of the printing keys so that each printing key is capable of effecting a vibration of the vibrator and ribbon from normal position backward toward the platen and then forward away from the platen. The vibrating means comprises a link 33 pivoted at 34 to the stem 23 and extending horizontally rearward, said link being connected at its rear end at 35 to the upwardly extending arm 36 of a bell crank lever which further comprises a forwardly extending arm 37. The bell crank lever is provided with a hub 38 which is secured by a set screw 39 to a rock shaft 40, said rock shaft as shown in Figs. 1 and 2 extending from side to side of the machine and bearing in standards 41 rising from the side plates 1^a of the base 1. The arm 37 of the bell crank carries a depending link 42, said link being connected to a universal bar 43 which extends from side to side of the machine beneath the key levers 7 and is adapted to be actuated by each of said key levers. The universal bar is supported at its ends by links 44 which depend from arms 45 secured to and extending horizontally rearward from a rock shaft 46 which bears in screw pivots 47 secured in the side plates 1^a of the base. The rock shaft 46 also carries a rearwardly extending arm 48 which is connected to and adapted to operate the carriage feeding or escapement devices (not shown). When any printing key is operated it will depress the universal bar 43, pulling down the link 42, swinging the bell crank 36, 37 on its pivot and moving the link 33 forward, said link swinging the stem 23 of the vibrator forward about the pivots 25 and swinging the upper part or body of said vibrator rearward so as to move the printing portion of the ribbon close to the platen in advance of the actuated type bar to receive the impact thereof. The restoring spring 9 of the actuated key lever will operate to return the said key lever to normal position; and a coiled spring 40^a on the rock shaft 40 may be provided to restore the train of vibrating devices and the vibrator to normal position. The vibratory movements of the ribbon carrier or vibrator are independent of its supporting frame. If the pivotal center 25 around which the vibrator is turned at printing operation is moved up or down toward and away from the printing point, the bodily normal position of the vibrator will be varied and the widthwise portion of the ribbon presented to the type by the following vibratory movements will be altered. Means are provided for moving the pivotal center 25 progressively up and down by automatic means so that the ribbon may be used progressively crosswise of its width. The automatic means in the present instance

comprise a double arc-shaped cam 49 which is adapted to engage with the roller 32 and to be turned so as to move said roller forward and rearward, thus causing the supporting member to swing on its fixed pivotal center 27, the parallel arms 26 of said member swinging up and down and bodily raising and lowering the ribbon vibrator. As best shown in Figs. 2 and 9, the device or cam 49 is integral with a hub portion 50, said hub portion being formed with a circumferential depression or groove 51. The cam member comprising the hub 50 and cam 49 bears loosely on a tubular bearing or sleeve 52 which is driven through an arm or lug 53 depending from the underside of the top plate 3 so that said tubular bearing is rigid on said arm. The ribbon winding shaft 16 passes through the tubular bearing 52, the bore of said bearing being greater than the diameter of the shaft so that the sleeve does not touch the shaft. The cam member 49, 50 is adapted to receive rotary movements from the ribbon driving shaft 16 through devices which comprise a pin 54, said pin being screwed into the cam member and extending laterally leftward therefrom and engaging loosely in a crank arm 55, said crank arm having a hub 56, the driving shaft 16 passing through said hub and the hub and crank arm being fixed to the shaft by a set screw 57. When the driving shaft 16 is turned the crank arm 55 will turn with it and will operate through the pin or connections 54 to turn the cam member on the tubular bearing 52. When the parts are related as shown in Fig. 8, the cam 49 will act on the roller 32 to swing the vibrator supporting frame on its pivot and vary automatically the bodily position of the vibrator and change the widthwise portion of the ribbon that is presented to the types. During swinging movements of the lever frame and the vibrator, the link 33 will swing up and down on the pivot 35 without affecting the bell crank which carries said pivot. It will be apparent that simultaneously with the bodily movement of the vibrator the ribbon will be fed lengthwise from one speed to the other so that in effect a simultaneous lengthwise and crosswise feed of the ribbon will be obtained, the path followed by the types being wavy or serpentine, as indicated by the dotted line *g* in Fig. 10. This figure shows a fragment of a ribbon 58 which is uniform in character throughout, having only a single color field which extends the full width of the ribbon.

It will be understood that when the cross feeding devices comprising the cam 49 and roller 32 are in cooperation, a uniform ribbon like 58 is usually employed, and not a ribbon having fields of different characteristics, such as the two-color ribbon

11 shown in Figs. 1, 2 and 11, which ribbon has parallel color fields or bands *b* and *c* extending lengthwise along opposite edge portions, it is desirable to dispense with the cross feed of the ribbon and to render the cam 49 inoperative so that the vibrator may be adapted to be set and maintained in predetermined normal positions to enable writing to be done lengthwise of the different fields *b* and *c* at pleasure. In order to dispense with the use of the cam 49 means are provided for sliding the cam rightward along the sleeve 52 until it is outside the plane of the roller 32, as shown in Fig. 2. Said means comprise a slide rod or bar 59 which extends outside the machine frame at the right, terminating in a finger button 60. The left-hand portion of the rod 59 is flattened as indicated at 61 and is formed with slots 62 which receive pivot screws 63, said screws being secured one in the arm 53 and the other in the right-hand arm or lug 16^a and providing bearings for the slide rod. At its left the slide rod terminates in an upwardly extending finger 64 which enters the groove 51 in the cam member. By means of the button 60 the slide rod may be pulled out or pushed in so as to slide the cam member to and fro on the sleeve 52 and effect a disengagement and reengagement of the cam 49 with the roller 32. During sliding movements of the cam member the pin 54 slides in its opening in the arm 55, and always maintains connection between the cam member and the driving shaft. In order to hold the cam member in engaged or disengaged position along its bearing, detent devices are provided, said devices comprising a spring arm or detent 65 which, as appears from Fig. 2, is secured by a screw 66 to the underside of the right-hand lug 16^a. The spring arm 65 extends leftward under the slide rod and its free end is bent into a V to engage with V-shaped notches 67 and 68 formed on the underside of the flattened portion 61 of the slide rod. When the spring arm is engaged with the notch 68 as shown in Fig. 2 the cam is inoperative. When the slide rod is pushed in the spring arm will disengage from the notch 68 and engage with the notch 67 as shown in Fig. 8, thereby resetting the cam 49 in operative engagement with the roller 32. In both its operative and inoperative positions the cam member will turn freely with the driving shaft 16, the finger 64 fitting loosely in the groove 51. When the cam 49 is withdrawn from operation the ribbon vibrator and the supporting arms 26 would drop down under the influence of gravity if additional means were not provided for controlling their position. Such additional means in the present instance are controlled by a key and are operated by said key to set and maintain the vibrator and its supporting member in predetermined posi-

tions. The means just referred to comprises a hand controlled abutment or supporting pin 69 (Figs. 1, 2 and 3), which underlies the left-hand one of the pair of arms 26 and extends laterally from a crank arm 70, said crank arm having a hub 71 which is secured by a set screw 72 to the inner or right-hand end of a rock shaft 73. Said rock shaft bears in lugs 74 depending from the under side of the top-plate and is adapted to be turned or rocked by devices which include a crank arm 75 secured to the rock shaft outside the left-hand lug 74 by a set screw 76 which passes through the hub 77 of said crank arm. The crank arms 75 and 70 provide in effect a bell crank with an elongated pivot 73, the arm 70 extending upward from the pivot 73 while the arm 75 extends rearward therefrom and is connected by a depending link 78 with a lever 79. Said lever lies at the left of the bank of printing key levers, being pivoted at 8 in the rear of the base and provided with a suitable restoring spring 9^a. The lever 79 terminates at its forward end in an upwardly extending portion 79^a near the top of which at 80 is pivoted a short key stem 81. The key stem 81 terminates at its top in a finger key or button 82 and at its lower end in a rearward hook 83. The pivotal movement of the key stem 81 on the key lever is limited by a pin and slot connection 84, 85. A leaf spring 86 secured to the lower end of the key stem coöperates with a lateral pin 87 on the lever extension 79^a to maintain the key stem normally substantially upright on said extension 79^a, as shown in Fig. 3. When the lever 79 has been depressed by pressing on the key 82 it may be locked in depressed position as shown in Fig. 1 by swinging the key stem 81 on its pivot 80, causing the hook 83 to engage with a coöperating detent. Said detent is in the form of a bent plate 88 (Figs. 1 and 6), said plate having slots 89 which receive screws 90 which adjustably secure the plate to the front of the usual comb plate or reed bar 91 or to any other suitable support. When the lever 79 is locked in the depressed or Fig. 1 position, it will operate through the described connections including the link 78 and bell crank 70, 75 to hold the supporting pin or abutment 69 locked in the position shown. The supporting pin will act on the left-hand arm 26 to maintain the supporting or lever member and the pivotal center 25 stationary so that when the key levers are operated the vibrator will be swung to and fro around a fixed center and will present the lower field *c* of the ribbon 11 to the types, causing said types to follow a straight path lengthwise of the field *c*, as indicated by the dotted line *h* in Fig. 11. When it is desired to make use of the upper ribbon field *b* of the ribbon 11 the lever 79 may be released by pressing rearward on the finger

key 82, permitting the spring 9^a to restore the parts to the position shown in Fig. 3. It will be apparent that during the movement of the parts from the Fig. 1 to the Fig. 3 position, the supporting pin, device or abutment 69 will swing forward and downward, permitting the arms 26 of the pivoted lever to swing down around the pivotal center 27, thus lowering the pivotal center 25 and bodily moving the vibrator downward so that when next vibrated by a printing key it will bring the ribbon field *b* opposite the printing point on the platen. As long as the parts are maintained in the Fig. 3 position the ribbon field *b* will be used and the types will follow a path longitudinal of said field as indicated by the dotted line *j* in Fig. 11.

In order to limit the setting movements of the vibrator under the control of the key lever 79 so as to write along the ribbon fields *b* and *c* of the two-color ribbon 11, adjustable stop means for the mechanism controlled by the lever 79 are provided. Said stop means are shown in Figs. 1, 2 and 4 and comprise an arm 92 secured by a set screw 93 to the left-hand end of the rock shaft 73 outside the machine frame. Said arm is adapted to coöperate with adjustable screw stops 94 and 95, each screw stop being provided with a locking nut 96. The screws 94 and 95 are supported in the downwardly converging arms 97 of a bracket 98, said bracket being secured by screws 99 to the under side of the top plate 3. The engagement of the arm 92 with the screw stop 95, as shown in Figs. 1 and 4, limits the upward movement of the pivotal center 25, while when the rock shaft 73 is swung oppositely the arm 92 will contact with the screw stop 94 to limit the downward movement of the pivotal center 25. The screw stops 94 and 95 are so adjusted that they substantially correspond with the limits of movement of the pivotal center 25 as determined when it is automatically controlled by the throw given by the cam 49. The result is that the width of the serpentine path *g* followed by the ribbon when it is automatically shifted widthwise, corresponds with the distance between the parallel paths *b* and *c* followed by the types when the ribbon is shifted widthwise and set by hand.

While, of course, a uniform ribbon may be shifted widthwise by hand by actuating the finger key 82 and the devices controlled thereby, and a two-color ribbon may be automatically controlled by the cam 49, it is usually desirable, as has been stated, to employ the cam with a uniform ribbon and the hand control with a two-color ribbon so that when a two-color ribbon like 58 is on the machine the automatic devices comprising the cam 49 will be employed ordinarily to the exclusion of the hand operated devices controlled by the key 82. Then, when the

uniform ribbon is removed and the ribbon of the dual characteristics like 11 is substituted in its place, the cam 49 will be thrown out and the hand operated devices made use of with such a ribbon 11.

It will be observed that by my present invention I provide simple and efficient mechanism for automatically controlling the vibratory ribbon so as to feed it widthwise and for controlling a ribbon or dual character so that either one of its fields may be made use of at pleasure.

Various changes may be made without departing from the spirit of my invention.

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

1. In a front-strike typewriting machine, the combination of a platen, a platen carrier therefor, a ribbon vibrator which normally leaves the printing point uncovered, devices for swinging said vibrator rearward toward the platen and forward away from the platen at printing operation, a pivotally mounted support for said vibrator, and means mounted independently of said platen carrier for moving said support on its pivot to change the normal bodily position of said vibrator.

2. In a front-strike typewriting machine, the combination of a platen, a platen carrier therefor, a ribbon vibrator which normally leaves the printing point uncovered, devices for swinging said vibrator rearward toward the platen and forward away from the platen at printing operation, a pivotally mounted support on which said vibrator is pivoted, and automatically operated means mounted independently of said platen carrier for swinging said support to vary the position of said vibrator.

3. In a front-strike typewriting machine, the combination of a platen, a ribbon vibrator which normally leaves the printing point uncovered, devices for swinging said vibrator rearward toward the platen and forward away from the platen at printing operation, a pivotally mounted support on which said vibrator is pivoted, means operative by hand to swing said support on its pivot and change the bodily position of said vibrator, and automatic means for swinging said support on its pivot.

4. In a front-strike typewriting machine, the combination of a platen, a platen carrier therefor, a ribbon vibrator which normally leaves the printing point uncovered, devices for swinging said vibrator rearward toward the platen and forward away from the platen at printing operation, a pivotally mounted support on which said vibrator is directly pivoted, and an automatically operating cam mounted independently of said platen carrier and coöperative with said support to move the same.

5. In a typewriting machine, the combina-

tion of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is directly connected, means for swinging said carrier at printing operation independently of said support toward and away from said platen substantially radially thereof, a cam coöperative with said support to move it and said ribbon carrier, and means for rotating said cam.

6. In a typewriting machine, the combination of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is directly connected, means for swinging said carrier at printing operation independently of said support toward and away from said platen and radially thereof, a power shaft, and operating connections between said shaft and said support.

7. In a typewriting machine, the combination of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is directly connected, means for swinging said carrier at printing operation independently of said support toward and away from said platen and radially thereof, a ribbon driving shaft, and a cam on said shaft coöperative with said support.

8. In a typewriting machine, the combination of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is directly connected, means for swinging said carrier at printing operation independently of said support toward and away from said platen and radially thereof, a ribbon driving shaft, a cam, connections between said shaft and said cam, and connections between said cam and said support.

9. In a typewriting machine, the combination of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is connected, means for swinging said carrier at printing operation independently of said support toward and away from said platen and radially thereof, an automatic cam coöperative with said support to swing it on its pivot and bodily move said ribbon carrier, and hand operated means for rendering said cam inoperative.

10. In a typewriting machine, the combination of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is connected, means for swinging said carrier at printing operation independently of said support toward and away from said platen and radially thereof, an automatic cam coöperative with said pivoted support to move it and said ribbon carrier, hand operated means for rendering said cam inoperative, and key controlled means for setting said support in predetermined positions.

11. In a typewriting machine, the combination of a platen, a vibratory ribbon carrier, a pivoted support with which said carrier is directly connected, means for swinging said carrier at printing operation inde-

pendently of said support toward and away from said platen and radially thereof, a ribbon driving shaft, a cam rotatable by said shaft and coöperative with said support, and
 5 hand operated means for bodily moving said cam out of operative position.

12. In a typewriting machine, the combination of a ribbon carrier, a movable support on which said ribbon carrier may be independently vibrated, a power shaft, a cam
 10 coöperative with said support, a tubular bearing for said cam, said bearing surrounding said shaft, an arm fixed to said shaft, and a pin connecting said cam with said
 15 arm.

13. In a typewriting machine, the combination of a ribbon carrier, a movable support on which said ribbon carrier may be independently vibrated, a ribbon driving
 20 shaft, a cam coöperative with said support, a tubular bearing for said cam, said bearing surrounding said shaft, an arm fixed to said shaft, a slidable connection between said cam and said arm, and hand controlled
 25 means for sliding said cam lengthwise of said tubular bearing.

14. In a typewriting machine, the combination of a vibratory ribbon carrier, a pivoted support on which said carrier is pivotally
 30 mounted, means for vibrating said carrier on its pivot at printing operation independently of said support, a power shaft, a cam rotatable thereby, said cam coöperating with said support to move the same together with said carrier, and hand operated
 35 means for sliding said cam lengthwise of said shaft to inoperative position, said hand operated means comprising a slide rod engageable with said cam.

15. In a typewriting machine, the combination of a vibratory ribbon carrier, a pivoted support with which said carrier is directly pivotally connected, means for vibrating
 40 said carrier on its pivot at printing operation independently of said support, a ribbon driving shaft, a cam thereon and rotatable thereby, said cam coöperating with said support to move the same together with said carrier, hand operated means for sliding
 50 said cam along said shaft to inoperative position, said hand operated means comprising a slide rod engageable with said cam, and detent devices operative on said slide rod to maintain it and said cam in set positions.
 55

16. In a typewriting machine, the combination of a platen, a platen carrier, a ribbon vibrator pivoted between its ends and carrying a ribbon at one side of its pivot, key
 60 controlled vibrating devices connected to said vibrator at the opposite side of its pivot, a support for the pivoted vibrator, and means mounted independently of said platen carrier for moving said support to change the
 65 bodily position of the vibrator.

17. In a typewriting machine, the combination of a platen, a platen carrier, a ribbon vibrator pivoted between its ends and carrying a ribbon at one side of its pivot, key controlled vibrating devices connected
 70 to said vibrator at the opposite side of its pivot, a pivoted member carrying the pivot of said vibrator, and means mounted independently of said platen carrier for swinging said member on its pivot to vary the
 75 normal bodily position of said vibrator.

18. In a typewriting machine, the combination of a ribbon vibrator, a support on which said vibrator is pivoted, means for vibrating said vibrator at printing operation
 80 independently of said support, automatic means for moving said support and changing the bodily position of said vibrator, means for dispensing with said automatic means, and separate means for thereafter
 85 changing the normal bodily position of said vibrator.

19. In a typewriting machine, the combination of a ribbon vibrator, a lever frame on which said vibrator is pivoted, means for actuating said vibrator at printing operation
 90 independently of said lever frame, a roller on said lever frame, a ribbon driving shaft, and a cam connected to be turned by said shaft and operating on said roller to swing
 95 said lever frame on its pivot.

20. In a typewriting machine, the combination of a ribbon vibrator, a movable support therefor, means for vibrating said vibrator independently of said support, and
 100 means for shifting said support and said vibrator to vary their normal positions, said last named means comprising a hand controlled abutment on which said support rests.
 105

21. In a typewriting machine, the combination of a platen, printing keys, a ribbon vibrator, a movable frame on which said vibrator is directly pivoted, means operative
 110 by the printing keys for vibrating said vibrator on its pivot substantially radially of the platen and independently of said movable frame, said frame remaining motionless during vibratory movements of said vibrator, and a shiftable key-controlled support
 115 for said frame, said support being shiftable independently of said printing keys to effect variation in the relationship between the vibrator and the platen.

22. In a typewriting machine, the combination of a platen, printing keys, a ribbon vibrator, a movable frame having a fixed pivot and on which said vibrator is itself
 120 directly pivoted, means operative by the printing keys for vibrating said vibrator on its pivot substantially radially of the platen and independently of said movable frame, said frame remaining motionless during vibratory movements of said vibrator,
 125 a shiftable key-controlled device on which

said pivoted frame is supported, and shifting means for said device operating independently of said printing keys to effect variation in the relationship between the vibrator and the platen, said shifting means comprising a bell crank lever, a link, and a key controlled lever.

23. In a typewriting machine, the combination of a platen, a ribbon vibrator, a movable frame on which said vibrator is directly supported, means for vibrating said vibrator in a direction substantially radially of the platen and independently of said frame, said frame remaining motionless during vibratory movements of the vibrator toward and away from the platen, a shiftable element on which said frame is supported, and mechanism for shifting and setting said shiftable element to vary the normal relationship between said vibrator and said platen, said mechanism comprising a key lever, connections between said key lever and said support, and locking devices for said key lever.

24. In a typewriting machine, the combination of a platen, a ribbon vibrator, a movable frame on which said vibrator is directly supported, means for vibrating said vibrator in a direction substantially radially of the platen and independently of said frame, said frame remaining motionless during vibratory movements of the vibrator toward and away from the platen, a shiftable element on which said frame is supported, and mechanism for shifting and setting said shiftable element to vary the normal relationship between said vibrator and said platen, said mechanism comprising a key lever, connections between said lever and said support, and locking devices for said key lever, said locking devices comprising a movable key controlled hook on said key lever, and an adjustable fixed element coöperative with said hook.

25. In a typewriting machine, the combination of a ribbon vibrator, a pivoted frame by which the vibrator is directly supported, means for vibrating said vibrator in a direction substantially radially of the platen and independently of said frame, a pin assisting to support said frame, an arm carrying said pin, a rock shaft on which said arm

is mounted, and key controlled means for rocking said shaft.

26. In a typewriting machine, the combination of a ribbon vibrator, a pivotally mounted frame on which said vibrator is itself directly pivoted, shiftable supporting devices for said frame comprising a key controlled rock shaft, and adjustable devices for limiting the rocking movements of said shaft.

27. In a typewriting machine, the combination of a ribbon vibrator, a pivotally mounted frame on which said vibrator is itself directly pivoted, shiftable supporting devices for said frame comprising a key controlled rock shaft, and devices for limiting the rocking movements of said shaft and comprising adjustable screw stops and an arm coöperative with said stops and connected to said shaft.

28. In a ribbon mechanism for typewriting machines, the combination with an upright ribbon guide lever pivoted between its ends, the upper arm guiding and normally maintaining the ribbon opposite the printing point, of a key at the keyboard of the machine, connections between said key and the lower arm of said guide, and means for setting said ribbon guide in a predetermined relation to the printing point.

29. In a ribbon mechanism for typewriting machines, the combination with an upright ribbon guide lever pivoted between its ends, the upper arm guiding and normally maintaining the ribbon opposite the printing point, of a key at the keyboard of the machine, connections between said key and the lower arm of said guide, means for setting said ribbon guide in a predetermined relation to the printing point, and means for locking said ribbon guide in shifted position.

Signed in the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 8th day of January, A. D. 1910.

GEORGE H. SMITH.

Witnesses:

CHARLES E. SMITH
E. M. WELLS.