

S. NIELSEN.
TYPE WRITING MACHINE.
APPLICATION FILED NOV. 26, 1906.

937,382.

Patented Oct. 19, 1909.

4 SHEETS—SHEET 1.

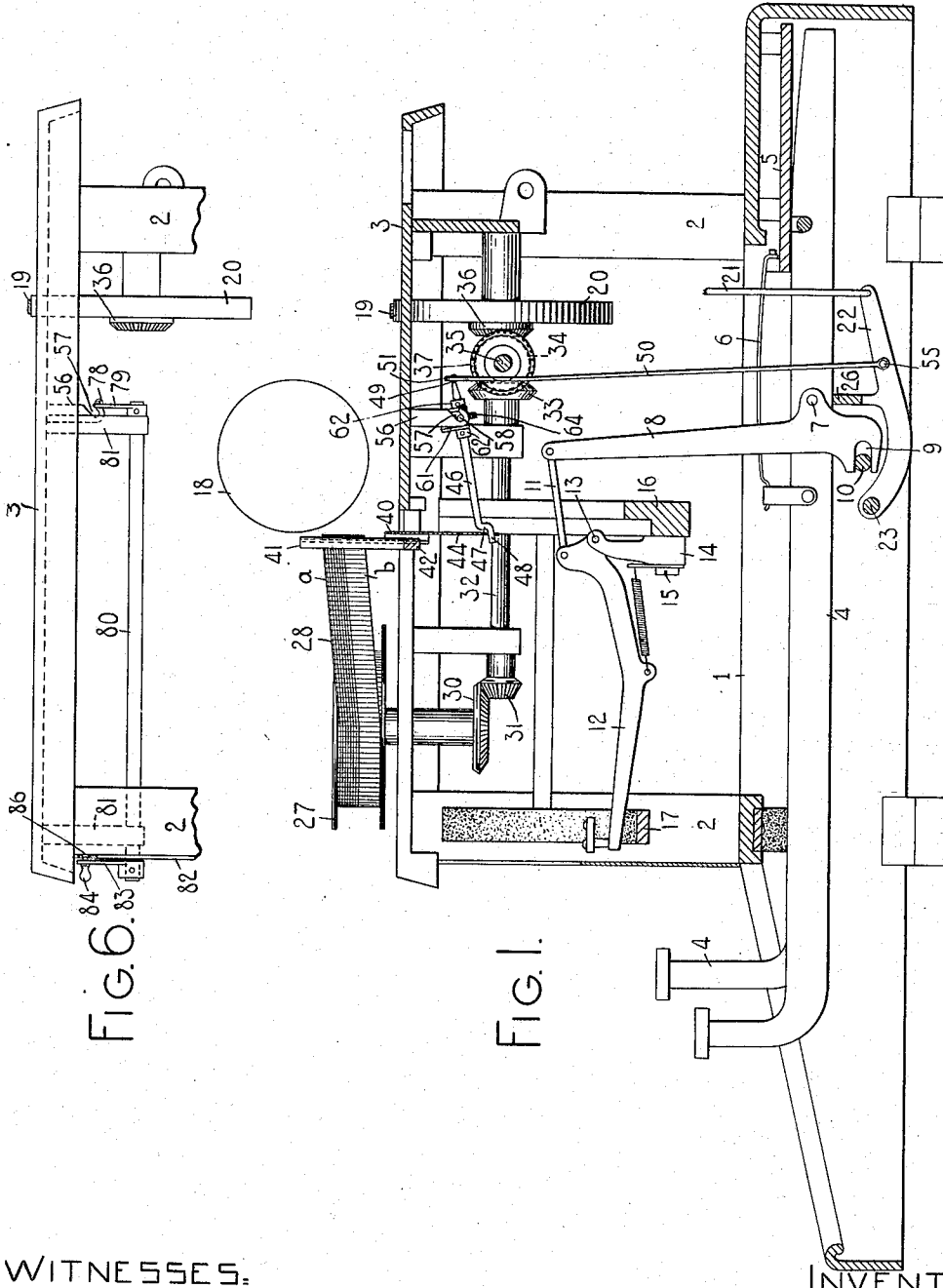


FIG. 1.

WITNESSES:

J. B. Reeves
m. v. Pool

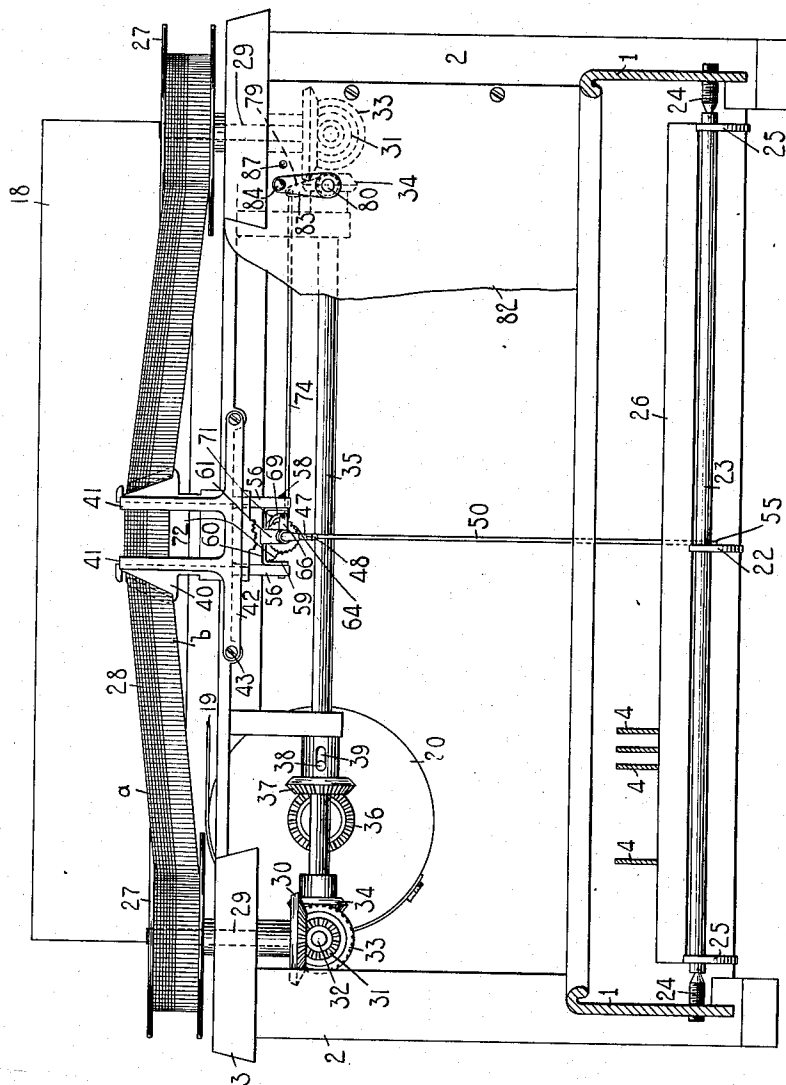
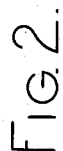
INVENTOR.

Stefanus Nielsen
By Jacob Feldt

HIS ATTORNEY

937,382.

4 SHEETS--SHEET 2.



J. B. Reeves
m.w. Pool

Stefanus Nielsen
By Jacob Felbel
HIS ATTORNEY

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4 SHEETS—SHEET 3.

FIG. 3.

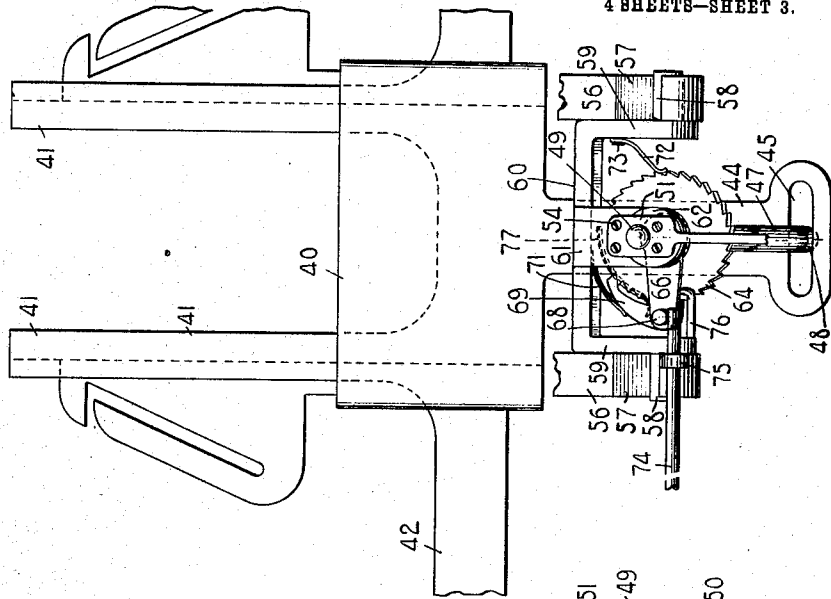
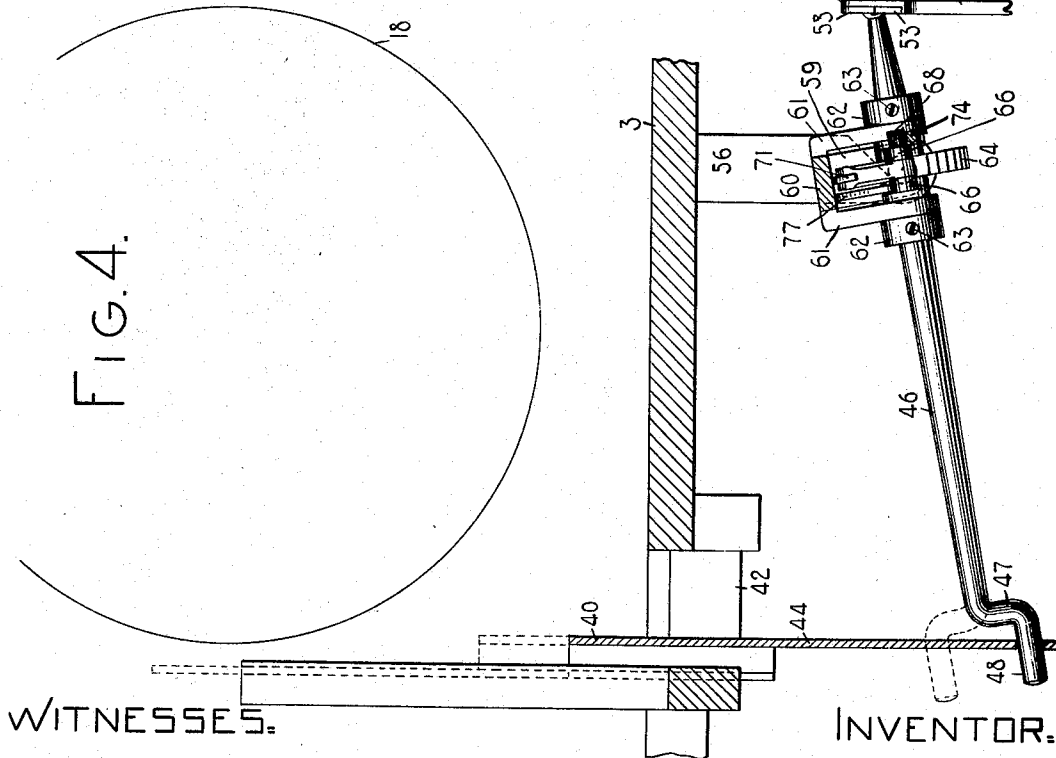


FIG. 4.



WITNESSES.

INVENTOR.

J. B. News
m.w. Pool

Stefanus Nielsen
By Jacob Felbel
HIS ATTORNEY

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4 SHEETS—SHEET 4

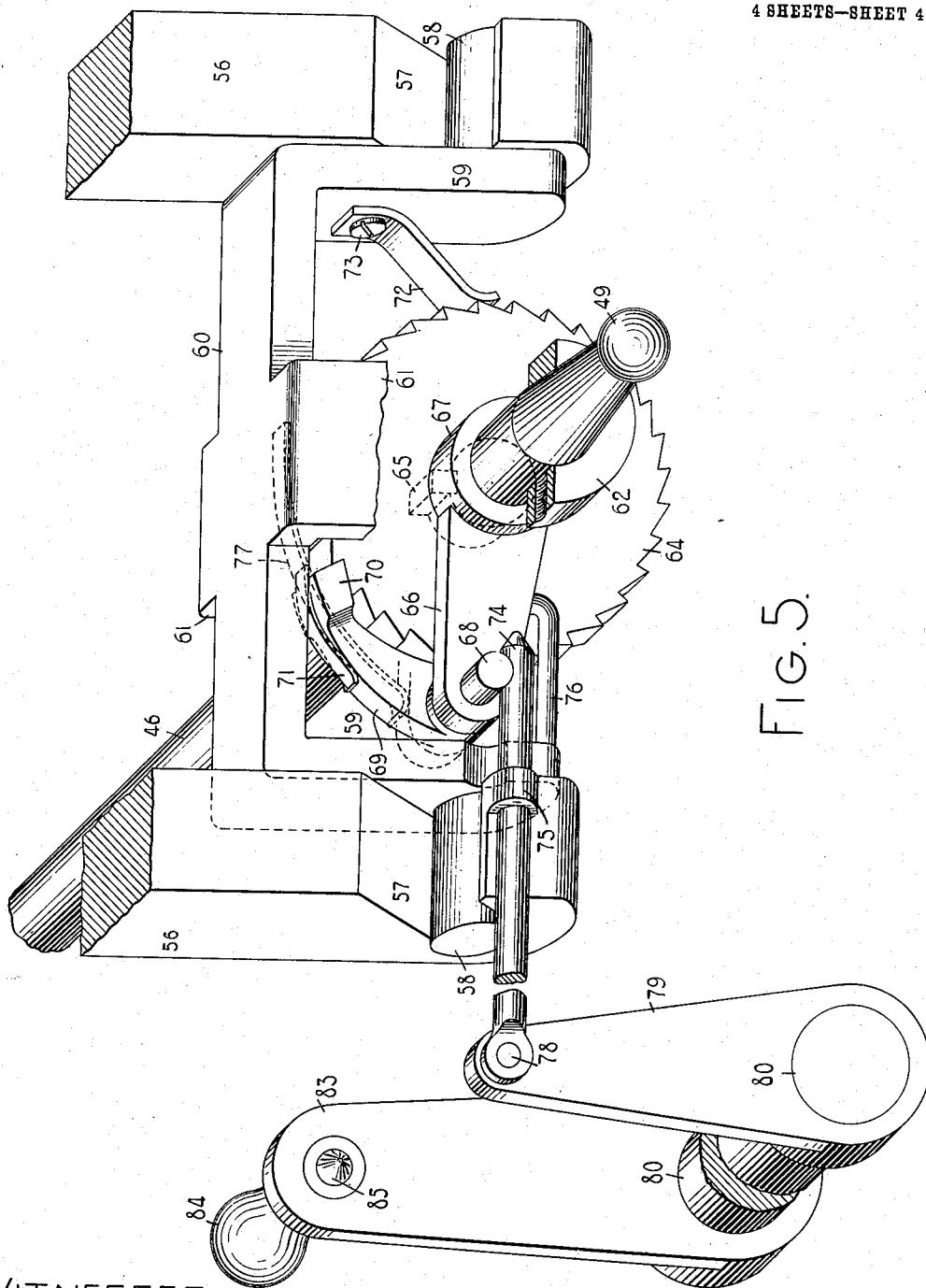


FIG. 5.

WITNESSES.

J. B. Reeves
Wm. Pool

INVENTOR.

Stefanus Nielsen
By Jacob Feldt
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

STEFANUS NIELSEN, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

937,382.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed November 26, 1906. Serial No. 345,073.

To all whom it may concern:

Be it known that I, STEFANUS NIELSEN, subject of the King of Norway, and resident of Van Nest, borough of Bronx, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

10 My invention relates more especially to the ribbon mechanism of typewriting machines.

In "visible" writing machines employing a ribbon it is usual to arrange the latter so that normally it does not cover the printing point and to provide means to automatically cause said ribbon to cover the printing point during printing operations and thereafter to return to normal position.

20 One object of my present invention is to provide a novel automatic crosswise ribbon feed operating in combination with the longitudinal feeding mechanism for the ribbon in visible writing machines.

25 Another object is to provide a construction wherein a ribbon having a plurality of printing fields may during printing operations be moved to cover the printing point with any desired printing field at will so that if the printing fields differ in character, as in color or the like, any desired color may be employed.

30 Another object is to provide means to dispense at will with the crosswise feed of the ribbon in that class of machines employing a vibratory ribbon carrier and wherein the ribbon has a crosswise and lengthwise feed.

35 A further object is to provide means to enable a so-called "polychrome" or "multi-color" ribbon to be employed in the last named class of machines.

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

45 In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a typewriting machine embodying my invention, parts of the machine being omitted. Fig. 2 is a transverse vertical sectional view of the machine taken on a plane just forward of the top plate, parts of the machine being omitted and parts broken away. Fig. 55 3 is an enlarged fragmentary rear view of

the vibratory ribbon carrier, its support and part of the novel means for actuating said carrier. Fig. 4 is an enlarged fragmentary vertical sectional view taken fore and aft of the machine and illustrating the ribbon carrier and parts of the novel means for actuating the same. Fig. 5 is an enlarged fragmentary perspective view illustrating parts of the novel means for actuating the ribbon carrier as they appear when viewed from the rear and at the left of the middle of the machine. Fig. 6 is a fragmentary side view of the upper part of the frame of the machine and showing certain features of my invention.

60 My invention is shown as applied to the machine commercially known as the Monarch typewriter, but it is to be understood that said invention may be adapted to other forms of writing machines.

70 Referring especially to Figs. 1 and 2 of the drawings, the main frame of the machine is shown as comprising the base 1, corner posts 2 and a top plate 3. Key levers 4 are fulcrumed on a fulcrum plate 5 in the rear of the base, each key lever being provided with a restoring spring 6 and having pivoted to it at 7 a sub-lever 8. Each sub-lever is slotted at its lower end portion at 9 to cooperate with a fixed abutment 10 and the upper end of each sub-lever is connected by a link 11 with a type bar 12 pivoted at 13 in a hanger 14, the latter being secured by a screw 15 to a segmental type bar support 16. The hangers are arranged in segmental series and the free ends of the type bars are normally supported on a segmental type rest 17, said type bars being adapted when their actuating mechanism is operated to cooperate with the front face of a rotary platen 18 which is diagrammatically illustrated. The platen is mounted in a platen carrier or carriage (not shown) which is connected by a band or strap 19 with a spring drum 20 which tends constantly to draw the carriage leftward over the top plate. The carriage is controlled by the usual or suitable letter space feeding mechanism including a vibratory dog carrier (not shown) which is connected by a link 21 with a lever arm 22 extending rearwardly from the middle of a rock shaft 23, the latter being pivoted at its ends on adjustable screw pivots 24. The arm 22 and the rock shaft 23 constitute part of the universal bar frame, the latter

also comprising side arms 25 which extend rearwardly and support along with the central arm 22 a universal bar proper 26, the latter extending from side to side of the machine beneath the key levers 4 and being adapted to be actuated when any of the latter or the spacing levers (not shown) are operated. The actuation of the universal bar operates through the link 21 on the letter space feeding devices, causing them to co-operate in a known manner to permit the carriage and platen to be drawn a letter space distance at a time toward the left by the spring drum 20.

Ribbon spools 27 are mounted horizontally above the top plate, one at each side of the machine and forwardly of the platen. Wound upon the ribbon spools and passing from one to the other in front of the machine is a ribbon 28, the one shown in the drawings being divided longitudinally into two fields or stripes *a* and *b* having different characteristics; that is to say, the field *a* may for example be of one color such as black and the field *b* of a different color such as red, or the field *a* may be record ribbon and the field *b* copying ribbon. The spools are adapted to be rotated to wind the ribbon back and forth between them by any suitable means such as that shown in the drawings which corresponds with the usual ribbon feeding mechanism of the Monarch machine and will be briefly described. Each ribbon spool is mounted at the upper end portion of a vertical shaft 29 fixed to the lower end whereof is a small beveled gear 30. Each gear 30 meshes with a beveled pinion 31 fixed to the forward end of a horizontal shaft 32, the latter carrying at its rear end a beveled pinion 33 which is adapted to mesh with a beveled driving pinion 34 fixed at one end of a driving or power shaft 35. It will be understood that the latter carries a driving pinion 34 at each end and that it is shiftable endwise to bring said driving pinions alternately into operative connection with their associate pinions 33 so as to drive one or the other of the spools 27. The driving shaft 35 is operatively connected with the spring drum 20 so that it is caused to rotate by said spring drum when the latter is turned in one direction. The connections between the spring drum and the driving shaft are of the usual sort and comprise a beveled pinion 36 which is connected with the spring drum by the usual pawl and ratchet (not shown) and which pinion 36 meshes with a beveled pinion 37 mounted on the driving shaft 35 and connected therewith by the usual pin and slot connection 38, 39 in such wise that while the driving shaft may move endwise without affecting said pinion 37, yet any rotary movement of the pinion is always transmitted to the driving shaft.

Midway between the ribbon spools the rib-

bon is threaded through slots formed in a vibratory ribbon carrier or vibrator 40 which is supported and guided on the upright arms 41 of a supporting bracket 42, the latter being secured by screws 43 to the top plate of the machine. The upper part of the vibrator may be of the usual style but the stem 44 of said vibrator is provided at its lower end portion as best shown in Fig. 3 with a horizontal slot 45. To cooperate with the vibrator 40 through the slot 45 I provide a novel form of operating lever 46, said operating lever being round in cross-section and slightly tapering as it approaches the front of the machine. The forward end portion of the operating lever is off-set as indicated at 47 (see especially Figs. 1 and 4), and an extension 48 projects forwardly from the off-set portion through the slot 45 in the stem of the vibrator. The extension 48 is long enough to enable its forward end portion to be grasped by the operator and readily turned. The operating lever 46 is pivotally mounted on the frame of the machine in a manner presently to be described at length and from said mounting it gradually tapers toward its rear end, as shown in Figs. 4 and 5, terminating in a ball-like part 49 which is adapted to cooperate with a socket-like bearing formed at the upper end of an actuating link 50. As shown in Figs. 3 and 4 the upper end portion of the link broadens out into a plate-like part 51 which is about half as thick as the body of the link. A pair of separable plates 53, which taken together correspond in shape with the part 51, are arranged face to face with said part 51 at the front side of the latter. The parts 51 and 53, it will be understood, are each formed with a bearing opening conforming in shape to the part of the ball-like member 49 which is received in said bearing opening, and said part 51 and the plates 53 are adapted to be secured together in any suitable manner as by screws 54 after the ball-part 49 has been arranged between them. The construction is such that a ball and socket or universal joint is provided between the operating lever 46 and the actuating link 50. It will be understood that after the securing devices 54 are in place the lever 46 and link 50 cannot be accidentally separated at the joint, but that relative movement between the link and lever in any direction is provided for. The lower end of the link 50 is pivotally connected at 55 (Fig. 1) with the arm 22 of the universal bar frame.

It will be noted that the off-set 47 and extension 48 at the forward end of the operating lever 46 are in the nature of a crank arm and handle. I so mount the operating member or lever 46 that it is capable of double or compound movement. It has a vibratory movement about a fulcrum or pivot

located between its ends under the influence of the actuating link 50 when the printing keys are operated and means are also provided for communicating to said operating lever 46 a movement of rotation about its own longitudinal axis so that the member 46 which has been termed a lever is likewise a shaft. It will be apparent that as a result of this last movement of rotation the extension 48 will be caused to revolve around the longitudinal axis of the operating lever as a center and that the ribbon carrier or vibrator 40 will have a linear movement thereby communicated to it and will be raised and lowered so that its normal position will be varied. Consequently when the operating lever is turned on its fulcrum under the actuation of the link 50, and the forward arm of said lever is swung upwardly, a different widthwise portion of the ribbon will be presented to the types, depending on the normal position from which the vibrator starts, said normal position in turn depending on the point at which the extension 48 happens to be located in its path of rotation at the particular time when the operating lever is swung about its fulcrum by the actuating link. The means shown for causing the operating lever 46 to rotate on its longitudinal axis may be caused to operate automatically during the vibratory movements of said lever and when so operated causes a progressive step-by-step turning movement of said lever at its longitudinal axis, thereby effecting a progressive variation in the normal position of the vibrator 40, gradually raising and lowering the same, thus varying the normal position of the printing portion of the ribbon. As a result the ribbon as it is fed longitudinally is also fed crosswise and the type impressions will follow a path on the ribbon which extends longitudinally thereof and curves or waves from side to side of the same. In other words, an automatic crosswise feed is combined with the longitudinal feed of the ribbon and the consequent curved or serpentine path followed by the type impressions will be similar in character to that followed by the type impressions in the regular Monarch machine. In the latter case, however, it will be recalled that the normal position of the vibrator is always the same, and that the throw or movement upward of the vibrator from this unvarying normal position is itself varied to alter the widthwise portion of the ribbon which is brought opposite the types.

In carrying out my invention in the present instance I journal the operating lever in a rocking frame or bracket which is pivoted on the frame of the machine, the construction being such that the downward pull of the actuating link turns said rocking frame on its pivots and raises the forward

end of the operating lever, the pivots of the rocking frame serving as a fulcrum for said operating lever. Fixed on the operating lever is a ratchet wheel which coöperates with a pawl the pivot whereof is adapted to remain fixed, the result of the coöperation between said ratchet and pawl being to effect a step-by-step turning movement of the operating lever on its longitudinal axis for the purpose above referred to, effecting a progressive crosswise feed of the ribbon.

Referring more in detail to the automatic crosswise feeding devices, 56 designates lugs depending from the top plate and one arranged at each side of the operating lever. The lugs are provided with inclined bearing slots 57, the mouths of which are at the rear and near the lower end portions of said lugs, said slots receiving studs or pivot pins 58 extending laterally from the lower end portions of the side arms 59 of a rocking frame, the latter also comprising a cross arm 60 and bearing arms 61 extending downwardly from the middle of said cross arm at the front and rear sides thereof. The rocking frame is best shown in Figs. 3, 4 and 5. Preferably it is formed of a single piece which is punched out and bent to the desired shape. The bearing arms 61 are provided near their lower ends with bearing openings through which the operating lever 46 passes and in which it is adapted to bear. Collars 62 are arranged on the operating lever, abutting the outer faces of the bearing arms 61 and are secured in place by set screws 63. The construction is such that the operating lever is supported at two points or places spaced apart lengthwise of said operating lever, these places or bearing points being in the arms 61 of the rocking frame or support. The rocking frame is adapted to vibrate on the studs 58 and is prevented from any movement toward one side or the other of the machine by the lugs 56 against which the arms 59 are adapted to abut, although normally said arms may turn freely between said lugs 56. The construction is such that when the actuating link 50 is operated an impulse is communicated through the operating lever 46 to the rocking frame, causing the latter to rock on its pivots and swinging the forward end of the operating lever 46 upwardly, the studs 58 serving in effect as the fulcrum of said operating lever. At the same time that the forward end of the operating lever is swung upwardly said lever is caused to turn slightly on its longitudinal axis, the turning means comprising a ratchet wheel 64 which is arranged on the operating lever midway between the bearing arms 61 and is secured in a fixed relation with said lever in any suitable manner as by a key 65 (Fig. 5). Preferably the ratchet wheel is arranged with respect to the axis of rotation of the rocking frame, so that the median

plane of said ratchet wheel, or the plane that passes centrally through it perpendicularly to its own axis of rotation, contains the axis of rotation of the rocking frame. This arrangement will be understood from a consideration of Fig. 4. Mounted on the operating lever at each side of the ratchet wheel 64 are supporting arms 66, said arms being provided with hub portions 67 which surround the operating lever and bear loosely on it, said hubs being confined between the ratchet wheel 64 and the bearing arms 61 of the rocking frame. At their outer ends the supporting arms 66 carry a pivot pin 68 of a pawl 69, said pawl being pivoted between the supporting arms 66 on the pin 68 and inclining upwardly and inwardly therefrom, terminating in a tooth 70 which coöperates with the teeth of the ratchet wheel 64. A flat spring 71, suitably secured at one end to the under side of the cross arm 60, coöperates with the outer face of the pawl 69 to maintain the tooth 70 thereof in engagement with the ratchet wheel 64. A spring detent 72 is secured by a screw 73 to the inner face of one of the arms 59 and is adapted to coöperate at its free end with the teeth of the ratchet wheel 64 to maintain said ratchet wheel in any of the positions to which it may be turned or set. The pivot pin 68 on which the pawl 69 turns projects rearwardly beyond the rear face of the rear supporting arm 66, as clearly shown in Figs. 4 and 5, and may lightly contact with the inner end portion of a slide rod 74 which is partly supported in the bearing ear 75 projecting rearwardly from the left-hand lug 56 just below the mouth of the slot 57 therein. As clearly shown in Fig. 4 the slide rod 74 is located at some distance away from and rearwardly of the axis of rotation of the rocking frame. Normally the under side of the rear supporting arm 66 is adapted to bear on and be supported by the upturned face of a stop pin 76 which is fixed to the lower end portion of the right-hand side arm 59 of the rocking frame and projects inwardly toward the operating lever as shown clearly in Figs. 3 and 5. A flat spring 77 is suitably secured at one end to the under side of the cross arm or bar 60, the free end of said spring coöperating with the top of the forward supporting arm 66 and tending to maintain the rear supporting arm 66 in contact with the stop pin or member 76.

Except for the slide rod 74 all of the parts thus far described for turning the operating lever on its longitudinal axis (including the ratchet wheel 64, the pawl 69 and the arms 66 supporting said pawl and carrying its pivot pin) are supported on the rocking frame. It will be apparent, therefore, that when the rocking frame and operating lever are vibrated, vibratory motion about the pivotal axis of the rocking frame will be

communicated to all of the parts just referred to except the slide rod 74 which will remain motionless. When therefore the actuating link 50 is pulled downwardly, turning the rocking frame on its studs and rotating the operating lever 46 about the pivotal axis of said rocking frame as a center, the projecting rear end portion of the pivot pin 68 will be forced downwardly against the inner end portion of the slide rod 74, and will be held by said slide rod from moving or rocking with the rest of the parts carried by the rocking frame, said slide rod acting as a fixed stop. The outer end portions of the supporting arms 66 will be held up by the co-action between the slide rod 74 and the pivot pin 68 which said arms carry, but the inner or hub portions 67 of said arms 66 will be carried or swung downwardly by the operating lever 46 on which said hubs are loosely supported. The construction is such that a relative turning movement of the arms 66 about the longitudinal axis of the operating lever 46 will be effected, the hubs 67 turning on said lever as they are swung downwardly with its rear arm about the center of rotation of the rocking frame and separating from the stop pin 76. The relative turning movement of the supporting arms 66 is transmitted to the pawl 69 carried by them and as the tooth 70 of said pawl is in spring-pressed engagement with the teeth of the ratchet wheel 64 a slight movement of rotation will be also transmitted to said ratchet wheel, causing it to turn slightly about its own axis, the latter being coincident with the longitudinal axis of the operating lever 46. As the ratchet wheel 64 is fixed to said lever 46 the slight axial turning movement of said ratchet wheel will be transmitted to said operating lever, causing the latter to turn slightly with the result that the extension 48 which has a circular path about the longitudinal axis of said lever is caused to travel slightly along its path and to change slightly the position of the ribbon vibrator 44, this change being distinct from the impulse or throw communicated to it through the lever 46 turning on its fulcrum 58.

From what has been said it will be understood that at each downward actuation of the link 50 a double or compound movement is transmitted both to the ratchet wheel 64 and operating lever 46, one part of this movement being the movement of rotation about the axis of rotation of the rocking frame, while the other part of the movement is a movement of rotation of the ratchet wheel and lever about their own coincident axes as a center. It will further be understood that the amount or extent of turning movement of the ratchet wheel about its own axis and the consequent extent of rotation of the operating lever 46 will depend

upon the extent of feed or relative turning movement of the pawl 69 and that the latter turning movement will be increased or decreased according as the slide rod or stop 74 is arranged to cooperate with the pin 68 farther from or nearer to the center of rotation of the rocking frame. In the present instance I provide the ratchet wheel 64 with thirty-two teeth and arrange the parts so that each downward actuation of the link 50 will cause the turning of said ratchet wheel through a distance corresponding to one of said teeth or one thirty-second of the circumference of a circle. It will be apparent that the corresponding extent of movement communicated to the ribbon carrier 40 will depend upon the distance of the extension 48 from the longitudinal axis of the operating lever; or, in other words, upon the length of the off-set or crank arm 47. The length of this crank arm may be varied if desired to vary the form or outline of the serpentine path which the type impressions will follow on the ribbon. During the return movements back to normal position of the vibratory ribbon carrier and the actuating mechanism therefor, under the influence of gravity and the usual restoring springs, it will be understood that a return rotary movement of the supporting arms 66 on the operating lever 46 will take place and that the pawl tooth 70 will ride backwardly over the top of the tooth on which it has been lying and will drop down on to the top of the longer face of the next tooth behind and in position to cooperate with the short working face of the tooth over which it has just ridden. In other words, it will be positioned relatively to the ratchet wheel as illustrated in Fig. 5, but will be engaged with the tooth behind (or at the left as viewed in Fig. 5) the tooth with which it is shown engaged in said Fig. 5.

The operation above outlined will be repeated with each actuation of the link 50 as long as the parts are arranged as shown in Fig. 5 and as a result thereof the extension 48 will turn progressively to the different points in its circular path. During this turning movement of the extension 48 it will move from side to side of the slot 45 in the stem 44 of the vibratory carrier and will control the normal position of said carrier so that said normal position will be progressively varied. The lowermost position from which said ribbon carrier may be lifted is that illustrated in Fig. 4 in the full lines, said position being determined by the lowermost point which the extension 48 reaches during its downward swing. The uppermost normal position of the ribbon carrier is illustrated in dotted lines in Fig. 4 and will be determined by the uppermost position which the extension 48 reaches in its swing or rotary movement. Between these two extreme

positions the ribbon carrier will be moved step-by-step to occupy other normal positions, the number of said positions depending on the number of teeth in the ratchet wheel 64. It will further be understood that although the normal position of the ribbon carrier will be varied, yet the extent of movement or throw communicated thereto by the operating lever 46 will at all times be the same since neither the fulcrum of said lever nor the length of the lever arms is ever changed.

My present improvements as thus far described afford novel means for combining with the lengthwise feed of the ribbon an automatic crosswise feed, and for thoroughly exhausting the entire surface of the ribbon. A ribbon which is intended to be fed both lengthwise and crosswise automatically is commonly uniform in character throughout, although, of course, some times a polychrome ribbon may be employed with such mechanism to obtain variagated or fancy printing. Usually, however, if a polychrome ribbon like that illustrated in the drawings is to be used it is desirable to write either entirely on one field or on the other field at will. To provide for so using the polychrome ribbon I employ means for dispensing at will with the automatic crosswise feed of the ribbon and for adjusting or setting the vibrator by hand in one of a plurality of predetermined normal positions so that under the unvarying and constant throw of the vibrator one or another of the ribbon fields will be brought opposite the printing point at will. In order to dispense with the automatic crosswise feed of the ribbon I arrange to shift the stop device or slide rod 74 out of the position in which it cooperates with the pawl carrying mechanism, so that the feeding movement of the pawl 69 may be dispensed with. Any suitable hand shifting mechanism may be employed for this purpose such as the mechanism shown in Figs. 1, 5 and 6 of the drawings. The outer end of the slide rod 74 is pivotally connected at 78 with a crank arm 79 fixed to and extending upwardly from a rock shaft 80. The rock shaft is arranged horizontally beneath the top plate, said rock shaft extending fore and aft of the machine and being supported in bearing lugs 81 depending from said top plate. The forward end portion of the rock shaft projects through the usual front plate 82 of the machine and has fixed to it outside said front plate an upwardly extending crank arm 83, the latter being provided with a handle or finger piece 84 and having projecting from its rear face a coned lug or tooth 85 which is adapted to engage with either of two holes 86 and 87 in the front plate in order to maintain the train of actuating mechanism and the slide rod 74 which it controls

in either of two predetermined positions. When the tooth 85 is engaged with the hole 86 in the front plate, the parts of the hand-actuated mechanism are in the position shown in Fig. 5 and the slide rod 74 is in operative position as shown in said figure. When it is desired, however, to dispense with the crosswise feed of the ribbon the handle 84 is swung rightward, causing the lug or tooth 85 to disengage from the hole 86 and to engage with the hole 87, thereby rocking the rock shaft 80 and sliding the slide rod 74 longitudinally outward in its bearing 75 until said slide rod has been drawn outwardly from under the pivot pin 68. The pivot pin and the supporting arms 66 and pawl 69 will be prevented from dropping downwardly under the influence of gravity after the withdrawal of the slide rod 74 by the stop 76 on the rocking frame. After the slide rod 74 has been withdrawn, as just described, it will be apparent that when the link 50 is actuated, vibrating the rocking frame, all the parts carried by said rocking frame, including the supporting arms 66, the pivot pin 68, the ratchet wheel 64 and the pawl 69, will be rocked with said rocking frame without affecting the relations among said parts. Consequently at the end of the downward pull of the link 50 all the parts carried by the rocking frame will be in the same relations that they were in at the beginning of the actuation of the link and no turning movement of the operating lever 46 about its longitudinal axis will take place, said operating lever merely turning about its fulcrum to raise the vibratory ribbon carrier. If it is desired to write on the upper field *a* of the ribbon the operator after sliding the slide rod 74 out of operative position, as described, takes hold of the extension 48 of the operating lever and turns it downwardly by hand until it has reached the full line position shown in Fig. 4, thereby lowering the ribbon carrier to its lowermost normal position. With the parts so arranged, if the printing keys be operated the vibrator will be raised upwardly only far enough to bring the upper field of the ribbon opposite the printing point. The throw of the vibrator is always the same and as at this time there is nothing to vary the normal position of said vibrator it will always return to the same normal position. Consequently the widthwise portion of the ribbon which is brought opposite the printing point will not vary and the type impressions will follow a straight path longitudinal of the upper field *a*.

When it is desired to make use of the lower field *b* of the ribbon, the operator swings the extension 48 upwardly by hand until it has reached the dotted line position shown in Fig. 4, thereby raising the vibrator to its uppermost normal position

and causing it when actuated to bring the lower field *b* of the ribbon opposite the printing point. It will be understood that the type impressions will follow a straight path longitudinal of the lower field *b* as long as the parts are related when in normal position as last described. The spring detent 72 exerts sufficient friction on the ratchet wheel 64 to maintain the operating lever in either of the positions in which it may be set by hand.

When it is desired to again make use of the automatic crosswise feed, the adjusting mechanism for the slide rod 74 is shifted back to the first described position, restoring the slide rod to the position shown in the drawings. The end of the slide rod may be pointed as at 74^a to insure its passing readily under the pin 68.

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

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

1. In a typewriting machine, the combination of printing keys, a carriage, a platen thereon, means for causing a ribbon normally removed from the printing point on the platen to cover the printing point when the printing keys are actuated, and means independent of the carriage and operating automatically during the manipulation of the printing keys to vary the normal position of the printing portion of the ribbon.
2. In a typewriting machine, the combination of printing keys, a carriage, a platen thereon, ribbon spools carrying a ribbon normally removed from the printing point on the platen, means for winding the ribbon from one spool to another, means for causing the ribbon to cover the printing point when the printing keys are actuated, and means independent of the carriage and operating automatically during the operation of the printing keys to vary the normal position of that portion of the ribbon which is between said spools.
3. In a typewriting machine, the combination of printing keys, a carriage, a platen thereon, a vibratory ribbon carrier, means for giving said carrier an unvarying extent of movement when the printing keys are actuated, and means independent of the carriage and operating automatically during the operation of the printing keys to vary the normal position of said ribbon carrier.
4. In a typewriting machine, the combination of types; a vibratory ribbon carrier; means for actuating the same including a vibratory lever; and means for automatically rotating said lever during its vibratory movements to vary the widthwise portion of the ribbon presented to the types.
5. In a typewriting machine, the combination of types; a vibratory ribbon carrier;

means for actuating the same including a vibratory lever having an unchanging fulcrum; and means for affording a rotation of said lever on its longitudinal axis to vary the widthwise portion of the ribbon presented to the types.

6. In a typewriting machine, the combination of types; a vibratory ribbon carrier; means for actuating the same including a vibratory lever having an unchanging fulcrum; and means for automatically rotating said lever on its longitudinal axis to vary the widthwise portion of the ribbon presented to the types.

7. In a typewriting machine, the combination of types; a vibratory ribbon carrier; a lever operatively connected with said ribbon carrier; means for vibrating said lever on its fulcrum to move the carrier from normal to operative position; and means for automatically moving said lever in another direction to change the widthwise portion of the ribbon presented to the types.

8. In a typewriting machine, the combination of types; a vibratory ribbon carrier; a lever operatively connected with said ribbon carrier; means for vibrating said lever on one axis of rotation to move the carrier from normal to operative position; and means for automatically turning said lever about another axis of rotation at an angle to the first axis to change the widthwise portion of the ribbon presented to the types.

9. In a typewriting machine, the combination of types; a vibratory ribbon carrier; a member for actuating the same having a double movement; means for moving said member in one direction to shift the ribbon carrier from normal to operative position; and means operating automatically to move the member in another direction to change the widthwise portion of the ribbon presented to the types.

10. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an actuating member; and means for simultaneously communicating rotary movements to said member in two directions, whereby the ribbon is moved an unvarying extent from a varying normal position to a varying printing position.

11. In a typewriting machine, the combination of types; a vibratory ribbon carrier; means for actuating the same including a vibratory lever; means for automatically rotating said lever during its vibratory movements to vary the widthwise portion of the ribbon presented to the types; and means for rendering said last recited means inoperative.

12. In a typewriting machine, the combination of types; a vibratory ribbon carrier; means for actuating the same including a vibratory lever having an unchanging fulcrum; means for automatically rotating said

lever on its longitudinal axis to vary the widthwise portion of the ribbon presented to the types; and means for rendering said last recited means inoperative.

13. In a typewriting machine, the combination of types; a vibratory ribbon carrier; a lever operatively connected with said ribbon carrier; means for vibrating said lever on its fulcrum to move the carrier from normal to operative position; means for automatically moving said lever in another direction to change the widthwise portion of the ribbon presented to the types; and means for rendering said last recited means inoperative.

14. In a typewriting machine, the combination of types; a vibratory ribbon carrier; a lever operatively connected with said ribbon carrier; means for vibrating said lever on one axis of rotation to move the carrier from normal to operative position; means for automatically turning said lever about another axis of rotation to change the widthwise portion of the ribbon presented to the types; and means for rendering said last recited means inoperative.

15. In a typewriting machine, the combination of types; a vibratory ribbon carrier; a member for actuating the same having a double movement; means for moving said member in one direction to shift the ribbon carrier from normal to operative position; means operating automatically to move the member in another direction to change the widthwise portion of the ribbon presented to the types; and means for rendering said last recited means inoperative.

16. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame together to move the ribbon carrier from normal to operative position; and means for progressively rotating said operating lever in said rocking frame to vary the widthwise portion of the ribbon presented to the types.

17. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame together to move the ribbon carrier from normal to operative position; and means for progressively rotating said operating lever in said rocking frame to vary the widthwise portion of the ribbon presented to the types, said last named means comprising a pawl and ratchet mechanism mounted on said rocking frame.

18. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame to move the

ribbon carrier from normal to operative position; means for progressively rotating said operating lever in said rocking frame to vary the widthwise portion of the ribbon presented to the types, said last recited means comprising a ratchet wheel fixed to said operating lever; and a pawl mounted in said rocking frame and operative on said ratchet wheel.

19. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame to move the ribbon carrier from normal to operative position; means for progressively rotating said operating lever in said rocking frame to vary the widthwise portion of the ribbon presented to the types, said last recited means comprising a ratchet wheel fixed to said operating lever; and a pawl carried by the supporting arms which are pivotally mounted on said operating lever.

20. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame to move the ribbon carrier from normal to operative position; means progressively rotating said operating lever on said rocking frame; and a connection between said operating lever and said vibratory ribbon carrier for causing the rotary movements of said operating lever to produce corresponding linear movements of said vibratory ribbon carrier.

21. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame to move the ribbon carrier from normal to operative position; means for progressively rotating said operating lever in said rocking frame to vary the widthwise portion of the ribbon presented to the types, said last named means comprising a pawl and ratchet mechanism mounted on said rocking frame; and means for rendering said pawl and ratchet mechanism inoperative.

22. In a typewriting machine, the combination of types; a vibratory ribbon carrier; an operating lever therefor; a rocking frame in which said lever is mounted; means for rocking said lever and frame to move the ribbon carrier from normal to operative position; means for progressively rotating said operating lever in said rocking frame to vary the widthwise portion of the ribbon presented to the types, said last recited means comprising a ratchet wheel fixed to said operating lever; a pawl mounted in said rocking frame and operative on said ratchet wheel; and means for rendering said pawl inoperative, said last named means compris-

ing a sliding stop rod and hand-actuated mechanism for moving said stop rod into and out of operative position.

23. In a typewriting machine, the combination of a vibratory ribbon carrier; an operating lever therefor; a rocking frame pivoted on a fixed part and in which said lever is mounted; means on said rocking frame for progressively turning said operating lever to vary the normal position of said ribbon carrier; and an actuating link having a universal joint connection with said operating lever.

24. In a typewriting machine, the combination of a ribbon, and means for bringing different widthwise portions of the ribbon to the printing point, said means comprising a lever automatically actuated at printing operation to move the ribbon to the printing point, said lever turning on an unvarying fulcrum and being mounted to move in two directions, the movement of the lever in one direction determining which widthwise field of the ribbon shall be presented for coöperation with the types, and the movement of the lever in the other direction effecting a movement of the ribbon to the printing point.

25. In a typewriting machine, the combination of a ribbon; an operating lever which may be automatically actuated at printing operation to move the ribbon to the printing point, said lever turning on an unvarying fulcrum and being mounted to move in two directions, the movement of the lever in one direction determining the widthwise portion of the ribbon which shall be presented to the types and the movement of the lever in the other direction effecting a movement of the ribbon to the printing point; and means for moving said lever in both of said directions at printing operation.

26. In a typewriting machine, the combination of a ribbon; an operating lever which may be automatically actuated at printing operation to move the ribbon to the printing point, said lever turning on an unvarying fulcrum and being mounted to move in two directions, the movement of the lever in one direction determining the widthwise portion of the ribbon which shall be presented for coöperation with the types and the movement of the lever in the other direction effecting a movement of the ribbon to the printing point; means for moving said lever in both of said directions at printing operation; and hand controlled devices for throwing the means for turning said lever in one direction into and out of operation at will.

27. In a typewriting machine, the combination of a ribbon vibrator; and means for actuating said vibrator, said actuating means comprising a combined shaft and lever through which motion is transmitted to the

vibrator, said actuating means also comprising means for simultaneously rotating said shaft and lever on both its longitudinal axis and on an axis at right angles to said longitudinal axis.

28. In a typewriting machine, the combination of a ribbon vibrator; a combined shaft and lever through which motion is transmitted to the vibrator; and means for automatically turning said combined shaft and lever on its longitudinal axis as it is being turned as a lever.

29. In a typewriting machine, the combination of a ribbon vibrator; a member constituting a combined shaft and lever; means for turning said member as a shaft; and means for vibrating said member as a lever, the vibration of the member effecting the movement of the vibrator to and from operative position, and the turning of the member as a shaft determining the widthwise portion of the ribbon which shall be presented to the types.

30. In a typewriting machine, the combination of a ribbon vibrator; a member constituting a combined shaft and lever; means for automatically turning said member as a shaft; means for automatically vibrating said member as a lever, the said vibration of the member effecting the movement of the vibrator to and from operative position, and the said turning of the member as a shaft determining the widthwise field of the ribbon which shall be presented for coöperation with the types; and means for throwing the means for turning said member as a shaft out of operation at will.

31. In a typewriting machine, the combination with types, of a ribbon vibrating mechanism comprising a vibratory carrier, an operating lever, means for automatically rotating said lever, at the same time that it is turned on its fulcrum, to vary the widthwise portion of the ribbon presented to the types, and means for rendering said last recited means inoperative, said mechanism also including hand operated means for setting said carrier in any one of a plurality of predetermined normal positions to present at will a predetermined widthwise portion of the ribbon to the types at printing operation.

32. In a typewriting machine, the combination with types, of a ribbon vibrating mechanism comprising a ribbon carrier, a lever having an unchanging fulcrum, means for automatically rotating said lever on its longitudinal axis to vary the widthwise portion of the ribbon presented to the types and means for rendering said last recited means inoperative, said mechanism also including hand operated means for setting said carrier in any one of a plurality of predetermined

normal positions to present at will a predetermined widthwise portion of the ribbon to the types at printing operation.

33. In a typewriting machine, the combination with types, of a ribbon vibrating mechanism comprising a ribbon carrier, a lever, means for turning said lever on its fulcrum to move the carrier from normal to operative position, means for automatically moving said lever in another direction to change the widthwise portion of the ribbon presented to the types, and means for rendering said last recited means inoperative, said mechanism also including hand operated means for setting said carrier in any one of a plurality of predetermined normal positions to present at will a predetermined widthwise portion of the ribbon to the types at printing operation.

34. In a typewriting machine, the combination with types, of a ribbon vibrating mechanism comprising a vibratory carrier, an operating lever therefor, means for vibrating said lever on one axis of rotation to move a carrier from normal to operative position and back, means for automatically turning said lever about another axis of rotation to change the widthwise portion of the ribbon presented to the types, and means for rendering said last recited means inoperative, said mechanism also including hand operated means for setting said carrier in any one of a plurality of predetermined normal positions to present at will a predetermined widthwise portion of the ribbon to the types at printing operation.

35. In a typewriting machine, the combination with types, of a ribbon vibrating mechanism including a vibratory carrier, a member for actuating the same having a double movement, means for moving said member in one direction to shift the ribbon carrier from normal to operative position, means operating automatically to move the member in another direction to change the widthwise portion of the ribbon presented to the types, and means for rendering said last recited means inoperative, said mechanism also including hand operated means for setting said carrier in any one of a plurality of predetermined normal positions to present at will a predetermined widthwise portion of the ribbon to the types at printing operation.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York this 23d day of November A. D. 1906.

STEFANUS NIELSEN.

Witnesses:

E. M. WELLS,
J. B. DEEVES.