A. T. BROWN.

TYPE WRITING MACHINE.

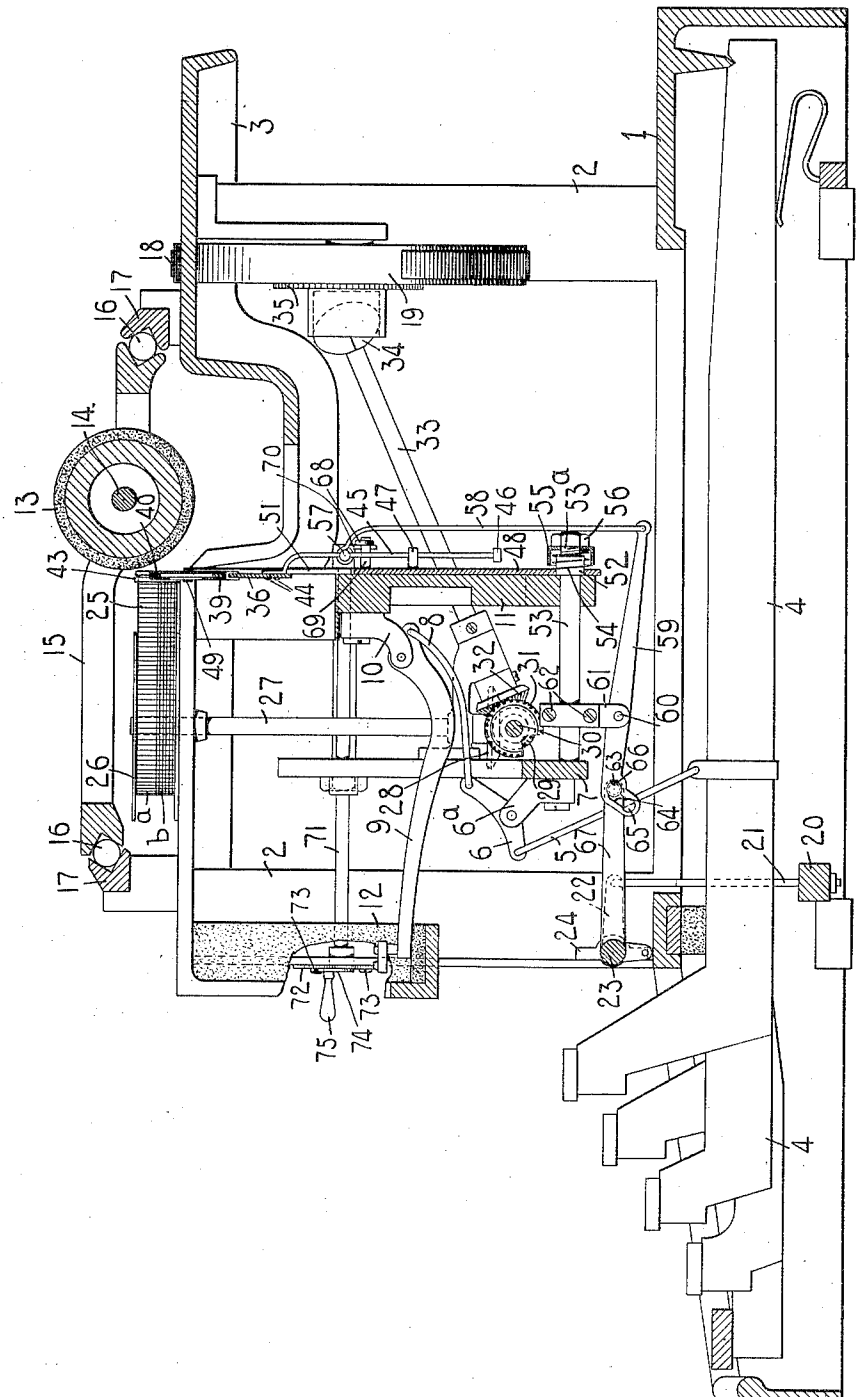
APPLICATION FILED NOV. 11, 1907.

1,098,707.

Patented June 2, 1914.

4 SHEETS—SHEET 1.

FIG. 1.



WITNESSES.

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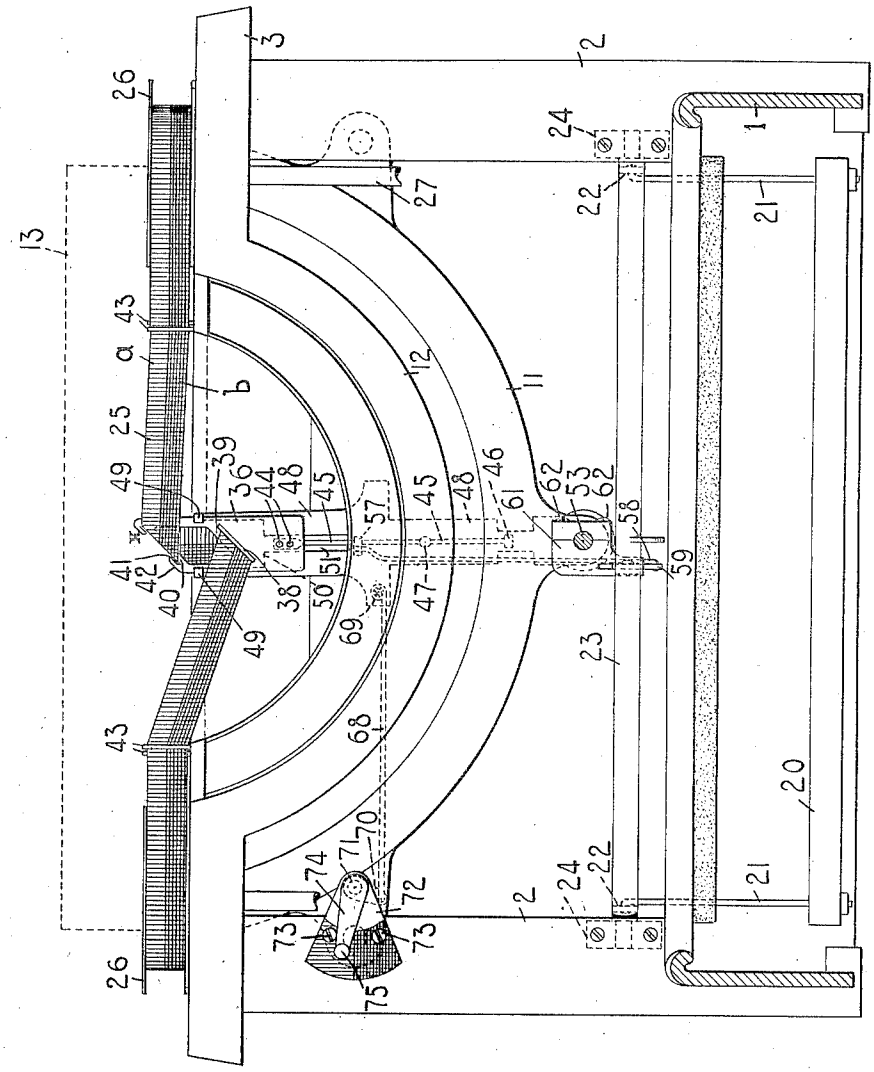
4 SHEETS—SHEET 2.

FIG. 2.



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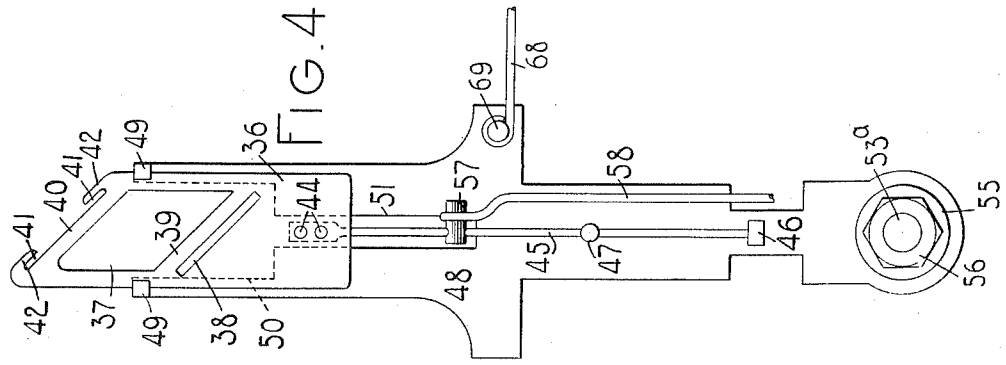
4 SHEETS—SHEET 3.

FIG. 4.



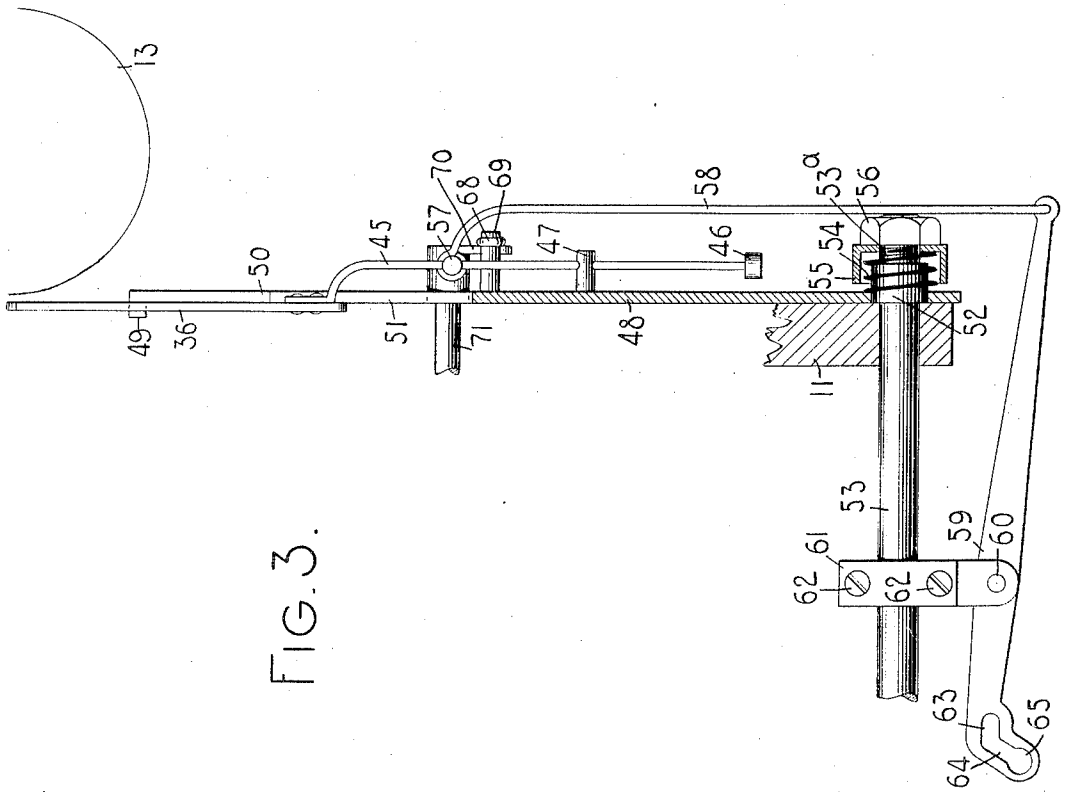


FIG. 3.

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4 SHEETS—SHEET 4.

FIG. 6.

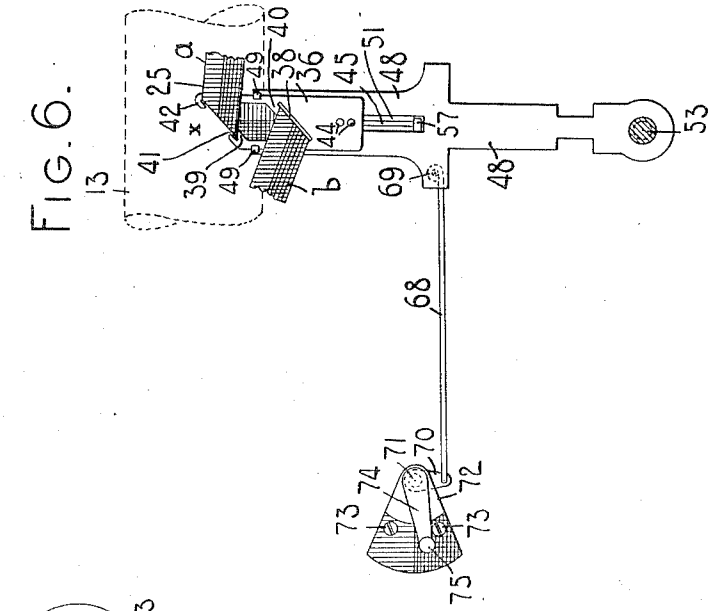
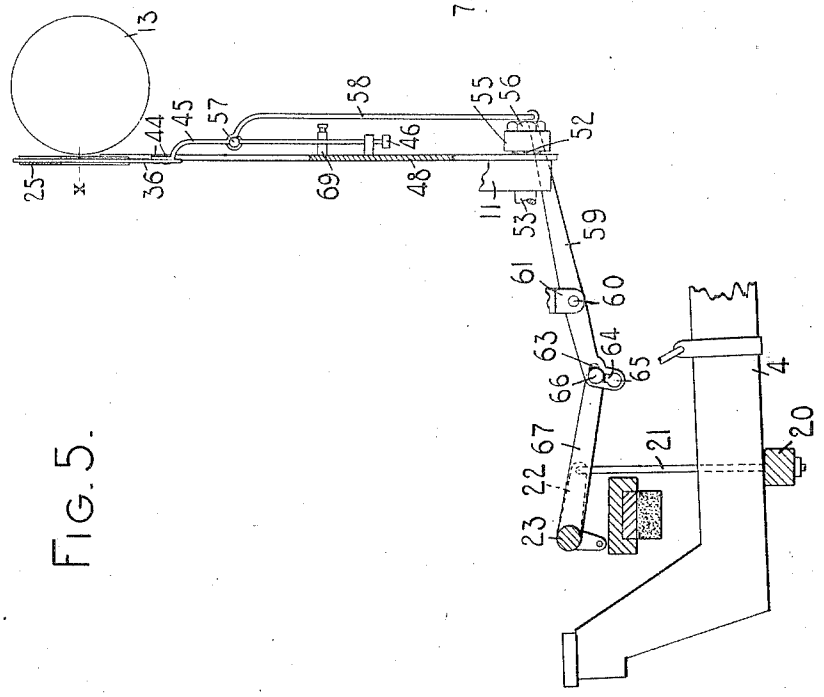


FIG. 5.



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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

1,098,707. Specification of Letters Patent. Patented June 2, 1914.

Application filed November 11, 1907. Serial No. 401,706.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, 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 has for its main object to provide improved devices of the class specified.

To this 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.

One form of the invention is illustrated in the accompanying drawings wherein—

Figure 1 is a vertical front to rear sectional view taken about centrally of a front-strike typewriting machine to which my invention is shown as applied, parts of the machine being omitted. Fig. 2 is a transverse sectional view of the machine, the section being taken on a vertical plane at the rear of the keyboard and parts of the machine being omitted. Fig. 3 is a side sectional view showing the vibratory ribbon carrier, its guide, the guide support and other parts, the view being drawn to a larger scale than Figs. 1 and 2. Fig. 4 is a rear elevation showing the vibratory ribbon carrier, its guide, the guide support and other parts drawn to the same scale as Fig. 3. Fig. 5 is a skeletonized side view of the vibratory ribbon carrier, its guide, actuating devices and other associated parts. Fig. 6 is a front elevation of the vibratory ribbon carrier, its guide, the guide shifting mechanism and other parts including the guide support which is shown in section.

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. Key levers 4 are fulcrumed in the rear of the base, each key lever being connected by a link 5 with a lever 6 pivoted on a hanger 6ª. The hangers supporting the levers 6 are suitably secured at the front of an upright support 7. Each lever 6 is connected by a link 8 with a type bar 9 pivoted to a hanger 10 which is secured to a type bar support 11 suitably mounted in the frame of the machine. The type bars are provided at their free ends with one or more types, two types being shown in the present instance. Said type bars are normally supported on a type rest 12 and are adapted when actuated to coöperate with the front face of a rotary platen 13, the axle 14 whereof is supported in a carriage 15, said carriage being adapted to move back and forth across the top plate on roller bearings 16 which bearings also coöperate with fixed track ways 17. The carriage is connected by a band or strap 18 with a spring drum 19 and its movements in printing direction are controlled by suitable escapement devices (not shown), said devices being operated from a universal bar 20 underlying the key levers 4 and supported at its ends by links 21 depending from arms 22 extending rearwardly from a rock shaft 23 journaled in bearing blocks 24 secured to the front corner posts 2.

A ribbon 25 is wound upon spools 26 horizontally arranged above the top plate one at each side of the machine and forward of the platen. Each spool is carried by an upright shaft 27 to the lower end of which is fixed a small beveled gear 28, the beveled gears being alternately turned to wind the ribbon on one spool from the other and vice versa. The ribbon winding mechanism may be of any suitable construction, that shown comprising beveled driving pinions 29, one for each gear 28, said pinions being fixed on a shaft 30 which may be moved to and fro endwise manually or by any suitable means to bring the pinions 29 into engagement alternately with their associate gears 28. The shaft 30 is adapted to be turned from the spring drum 19 during the movements of the latter in one direction and the connections for this purpose between said shaft and said spring drum include a beveled pinion 31 slidably connected with the shaft and a beveled pinion 32 meshing with the pinion 31. The pinion 32 is fixed to the lower end of a rearwardly and upwardly inclined shaft 33 which is operatively connected by a universal joint 34 with the usual ratchet wheel 35 which is adapted to be turned by the spring drum 19 as the latter draws the carriage in printing direction.

Such of the mechanism hereinbefore described as is original with me is not claimed in the present case but forms the subject-matter of other applications filed by me.

Referring now to the novel parts of my

invention these include a vibratory ribbon carrier or guide which in the present instance, as shown clearly in Figs. 3 and 4, comprises a head or plate-like member 36 formed at its upper portion with a type opening 37. The upper and lower edges of the type opening are diagonal and parallel and below the lower edge is formed a slot 38, the edges of which are parallel with the lower edge of the type opening. The thickness of the metal between the slot 38 and the type opening forms a turning bar or device, designated as 39. Above the type opening is a turning bar or device 40 parallel with the turning bar 39 and above the turning bar 40 and at the ends thereof are grooves 41 formed by the oppositely extending projections or guards 42. The head 36 is arranged just in front of the platen being normally below the printing point thereon and about midway between the ribbon spools 26. These ribbon spools, as best shown in Fig. 1, are somewhat nearer the front of the machine than the vibratory ribbon carrier. The ribbon 25 is led off the right-hand spool at the front thereof and passes through a stationary guide 43 fixed to the top plate, thence being led through the grooves 41 over the front of the turning bar 40 after which it takes a turn downward behind the head 36 crossing the type opening 37 and passing over the lower turning bar 39, thence forward through the slot 38 where said ribbon again takes a turn upward and leftward, passing through a stationary guide 43 fixed to the top plate and thence winding on the left-hand ribbon spool 26 at the front thereof. The turning bars or devices are disposed or inclined approximately at angles of 45° to the vertical, so that the portion of the ribbon between said turning bars that bridges the type opening, which portion may be called the printing portion of the ribbon, is substantially vertical while the portions of the ribbon connecting this printing portion with the two spools are at angles to said printing portion. The arrangement is such that the printing portion of the ribbon is arranged crosswise or substantially at right angles to the general direction of the ribbon between the spools as well as to the direction in which the ribbon winds on one spool and off the other spool, to the lines of print on the platen and to the platen axis.

Suitably secured to the head 36 as by rivets 44 is a rod 45, said rod being in the nature of a stem and the stem 45 and head 36 constituting the vibratory ribbon carrier or vibrator. The rod 45 after curving rearwardly from the lower end of the head 36, extends vertically downward and is provided at its lower end with a head 46. The rod passes through and has a sliding connection with a lug 47 extending rearwardly from a guide or support 48 for the vibratory ribbon carrier. This guide or support is shown in detail in Figs. 3 and 4. It is arranged at the rear of the type bar segment or support 11 and extends vertically upward in front of the rod 45 but behind the head 36 of the ribbon carrier, said head being adapted to move up and down over the front face of said guide and being guided in these movements by short inwardly extending fingers 49 at the top of the guide, said fingers providing grooves with which the sides of the head 36 coöperate. Between the fingers 49 and for some distance below them the guide 48 is cut away as indicated at 50 and from the lower end of the cut-away extends downward a slot 51 through which the rod 45 passes rearward from the back of the head 36. The guide 48 is adapted to be swung from side to side to permit different parts of the printing portion of the ribbon to be brought into cooperation with the printing instrumentalities or type bars and to this end the guide is pivoted at its lower end portion on the enlargement 52 of a rod 53, said rod extending between and being fixed in the supports 7 and 11. The guide 48 is formed with an opening which bears on the enlargement 52 and said guide at the parts surrounding said opening is pressed against the rear of the support 11 by a wire spring 54 which is coiled around the enlargement and is confined between the back of the guide 48 and the bottom of a cup-like housing 55. This housing may be adjusted relatively to the back of the guide in order to regulate the pressure of the spring 54 which serves as a friction spring to assist in maintaining the guide 48 in either of the positions to which it may be swung or adjusted. Any suitable means for adjusting the housing 55 and regulating the pressure of the spring may be used. In the present instance I have shown the rear end portion 53ª of the rod 53 as reduced and threaded to receive an adjusting nut 56 which contacts with the housing 55 and may be turned toward or away from the back of the guide 48 so as to increase or decrease the pressure or tension of the spring 54.

The vibratory ribbon carrier may be moved upward at printing operation to cause the printing portion of the ribbon to cover the printing point by any suitable means, that shown in the drawing comprising a pin or lug 57 extending laterally from the rod 45 and connected with the upper end portion of a link 58, said link pivoting on the lug 57 and projecting rearwardly from the lug and then extending vertically downward, being pivotally connected at its lower end with the rear arm of an operating lever 59. The operating lever is fulcrumed at 60 to a bearing block 61, the latter comprising two parts

which together completely surround or embrace the rod 53 and are fastened together by screws 62, the construction being such that the sectional bearing block is thereby clamped or fixedly secured to the rod 53. The forward arm of the operating lever is provided with a slot composed of a straight end portion 63, a portion 64 disposed at an angle to the portion 63 and an enlarged end portion 65. Normally engaging with the straight portion 63 of the slot is a headed pin 66 projecting laterally from the rear end of an arm 67, which arm is fixed to the rock shaft 23 near its middle and projects rearward from said rock shaft.

When a key lever 4 is depressed it depresses the universal bar 20 and rocks the rock shaft 23, causing the arm 67 to swing downward and the pin 66 to press down the forward arm of the lever 59 and elevate the rear arm thereof. The rear arm in turn as it moves upward, elevates the vibratory ribbon carrier, said carrier sliding on the guide 48, which remains stationary during the vibratory movements of the carrier. Said carrier during its movements to and from the printing point coöperates with the guide or support 48 at three points or places, namely, at the bearing opening in the lug 47 and at the grooves formed by the fingers 49. During the movement of the ribbon carrier from normal position (Fig. 1) to printing position (Fig. 5) the pin 66 will engage with the lower wall of the slot portion 63, which slot portion extends substantially radially of the fulcrum 60 of the operating lever. In disassembling the parts, the operating lever 59 may be disconnected from the arm 67 by moving the pin 66 down in the slot portion 64 until said pin is in the enlarged slot portion 65 through which the head of said pin may be withdrawn. Of course the depression of the universal bar 20 by the operated key lever causes the escapement devices to coöperate and also operates certain of the printing instrumentalities, causing the type bar which is connected with the operated key lever to be moved from normal position to printing position. During the vibratory movements of the ribbon carrier the guards 42 prevent the ribbon from being displaced from the upper turning bar 40. Assuming that the guide 48 is positioned as shown in Fig. 2 the upward movement of the ribbon carrier just described will move the printing portion of the ribbon upward and bring the right-hand half of said printing portion opposite the printing point on the platen, which point is designated in Figs. 2 and 5 by the reference character x. The length of the printing portion of the ribbon, and by length I mean the stretch between the adjacent edges of the two turning bars 39 and 40 is such that the types on the operating type bar will not contact either with the turning bars or with that portion of the ribbon overlying the upper turning bar. One advantage of this construction is that if a narrow ribbon be employed in a machine having a shifting platen there is no necessity of shifting the ribbon carrier when the platen is shifted in order to maintain the printing portion of the ribbon in an unvarying relation with the platen in either of the positions to which said platen may be shifted. The type block when in printing position extends lengthwise of the ribbon at the printing portion thereof instead of widthwise thereof as is usual, so that the various expedients which have to be resorted to when a narrow ribbon is employed, in order to confine the type impressions to a desired portion of the ribbon are unnecessary. The printing operation having been completed the operated key lever may be released and the parts will then return to normal position by the aid of the usual or suitable restoring springs. In the present instance I have not shown any restoring spring directly connected with the ribbon carrier but have found in practice that gravity is sufficient for this purpose in addition to the spring restoring means of the escapement devices.

From what has been said it will be apparent that with the parts in normal position as shown in Fig. 2 only one-half the width of the ribbon will be brought into contact with the printing instrumentalities during the to-and-fro longitudinal feeding movements of the ribbon. I provide means for shifting the guide 48 sidewise, or in a direction substantially lengthwise of the platen and the lines of print, and using also the other half of the ribbon, said means being operative at will to make use of either half of the ribbon. This means, to be presently described in detail, may be, of course, advantageously employed with a ribbon having uniform characteristics throughout and when used with such a ribbon will aid in uniformly exhausting the ink thereof, enabling more service to be obtained from the ribbon than could be obtained if the printing were done in only one line or path lengthwise of said ribbon. The means, however, is of especial advantage in connection with a ribbon having a plurality of fields of different characteristics such as the ribbon 25 shown in the drawings. This ribbon is divided into two longitudinal stripes or fields designated by the reference characters a and b, for purposes of description. It may be assumed that the field a is red in color and the field b black, although it will, of course, be understood that these fields may differ in any other respect. It will be seen from the drawings that with a two-color ribbon of this character the printing portion of the ribbon will be vertically

divided, the right-hand side or half being red and the left-hand side or half being black.

As has been stated, the guide 48 is pivotally mounted so that it may be shifted and set in a plurality of positions. The shifting means is designed to be conveniently actuated by the operator from the front of the machine and as shown comprises a link 68 pivotally connected with a lug 69 projecting rearward from the guide 48, said link extending horizontally leftward from said lug 69 and being pivotally connected at its left-hand end with an arm 70 extending from a rock shaft 71. The rock shaft has bearings in the supports 7 and 11 and extends forward toward the front of the machine, its front end portion bearing in a triangular plate 72 secured by screws 73 to the front of the left-hand front corner post 2. In front of the plate 72 a second arm 74 is fixed to the rock shaft 71, said arm 74 being provided at its outer end with a finger piece or handle 75. The construction is such that when the handle 75 is moved up or down the rock shaft 71 is rocked and the link 68 is moved endwise, causing the guide 48 to swing from one side to the other on its support. The screws 73 may serve as stops to limit the movement of the arm 74, and the plate 72 is preferably provided opposite the handle 75 with markings or indices corresponding with the fields of the ribbon, these markings in the present instance being the colors red and black. As shown in Fig. 2 the arm 74 is in contact with the upper screw 73 and the handle 75 is opposite the red mark on the index plate 72 while the guide 48 is inclined slightly to the left so that when the ribbon carrier is vibrated the right-hand half or red color field of the printing portion of the ribbon will be brought opposite the printing point x on the platen. When it is desired to make use of the left-hand or black half of the printing portion of the ribbon the handle 75 is moved downward until the arm 74 contacts with the lower screw 73 as shown in Fig. 6. A downward movement of the arm 74 rocks the shaft 71 and forces the link 68 longitudinally rightward, causing the guide 48 to be shifted or swung rightward on the rod 53 to the position indicated in Fig. 6. This shifts the printing portion of the ribbon lengthwise of the platen and lines of print and brings the field b of the ribbon directly below the printing point x on the platen so that thereafter when any printing key is actuated the ribbon will be elevated to bring the left-hand half of the printing portion of the ribbon opposite the printing point and the actuated type bars will cooperate with said left-hand or black half of the ribbon. It will be seen that I have provided a ribbon field changing mechanism comprising a shiftable guide on which a vibratory ribbon carrier is arranged to move; that the vibratory ribbon carrier is provided with a plurality of oblique surfaces or turning bars around which the ribbon is looped; and that a movement of the carrier lengthwise of the lines of print or in the direction of the length of the ribbon between the ribbon spools or supporting devices moves the loop of ribbon, or that part comprising the printing portion of the ribbon without moving the main part of the ribbon or slackening the tension of the ribbon.

The guide 48 will be maintained set in either of its working positions by the aid of the friction device or spring 54 and this device may be assisted in its function by mounting the rock shaft 71 somewhat tightly in its bearings so that considerable friction is generated at said bearings and this friction, of course, will help to maintain the rock shaft 71, the link 68 and the guide 48 set as desired. The actuating devices for the ribbon carrier will operate easily and freely in either of the set positions of the guide 48, the actuating link swinging laterally during the shifting movements at the point where said link is pivotally connected with the rear arm of the operating lever 59.

When it is desired to again make use of the field a the handle 75 may be moved upward until the arm 74 again contacts with the upper screw 73, thus reshifting the guide and restoring the parts to the positions shown in Fig. 2.

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, a ribbon-carrier having a reciprocating movement at each operation of a type key, and a guide on which the ribbon-carrier travels, the guide being pivotally supported on a single fixed axis which extends lengthwise of the machine and on which the guide is angularly movable to change the direction of the path in which the carrier travels.

2. In a typewriting machine, the combination with a vibratory ribbon carrier, of actuating devices therefor comprising two levers and a link, the levers having fixed fulcrums between which the levers are connected together by a pin-and-slot connection, and the link being connected to one of said levers and to the carrier.

3. In a typewriting machine, a ribbon carrier having a reciprocating movement at each operation of a type key, a pivoted guide on which the ribbon-carrier travels, and an adjustable frictional device mounted on a

fixed support and acting against one of the faces of the guide.

4. In a typewriting machine, the combination with a platen and printing instrumentalities, of a vibratory ribbon carrier, a guide for said carrier, a pivotal support for said guide, a frictional device comprising a friction spring surrounding said pivotal support, and means for varying the tension of the spring, said frictional device being cooperative with said guide, and means for turning said guide on its support to vary its position.

5. In a typewriting machine, a ribbon carrier having a reciprocating movement at each operation of a type key, a laterally shiftable guide on which the ribbon-carrier travels, a hand-actuated device at one side of the machine, and a connection between said device and guide, the device being operative to shift the guide.

6. In a typewriting machine, a ribbon carrier having a reciprocating movement at each operation of a type key, a laterally shiftable guide on which the ribbon-carrier travels, a rock shaft extending rearwardly from the front of the machine at one side thereof, a connection between the rock shaft and guide, and a handle connected to the rock shaft at its front end.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York this 8th day of November A. D. 1907.

ALEXANDER T. BROWN.

Witnesses:

CHARLES E. SMITH,

J. B. DEEVES.