

H. A. CARHART.  
 TYPE WRITING MACHINE.  
 APPLICATION FILED AUG. 4, 1913.

1,127,731.

Patented Feb. 9, 1915.

3 SHEETS-SHEET 1.

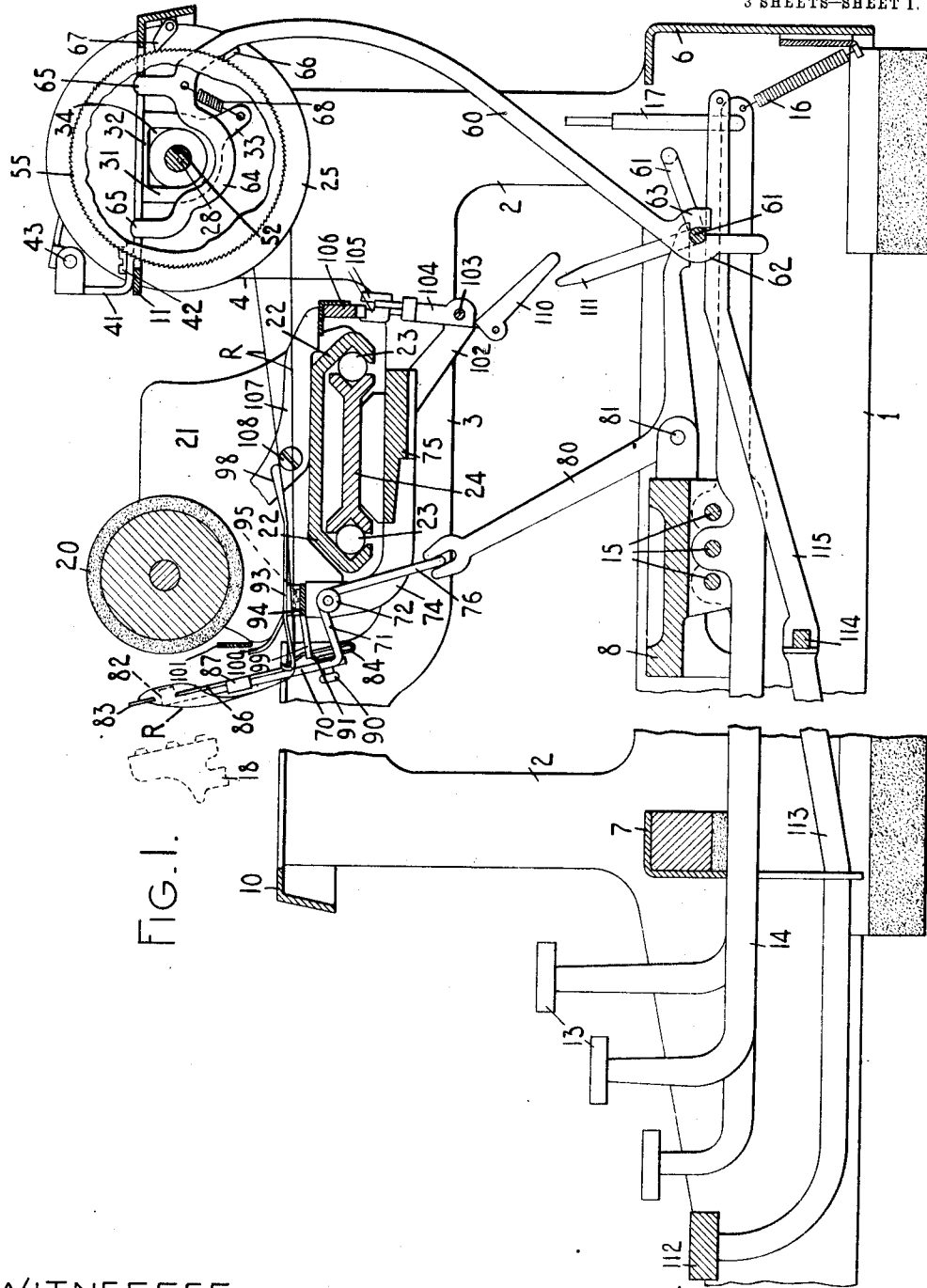


FIG. 1.

WITNESSES

*L. Nelson*

*R. H. Trotter*

INVENTOR:

*Herbert A. Carhart*

*By Jacob Felber*

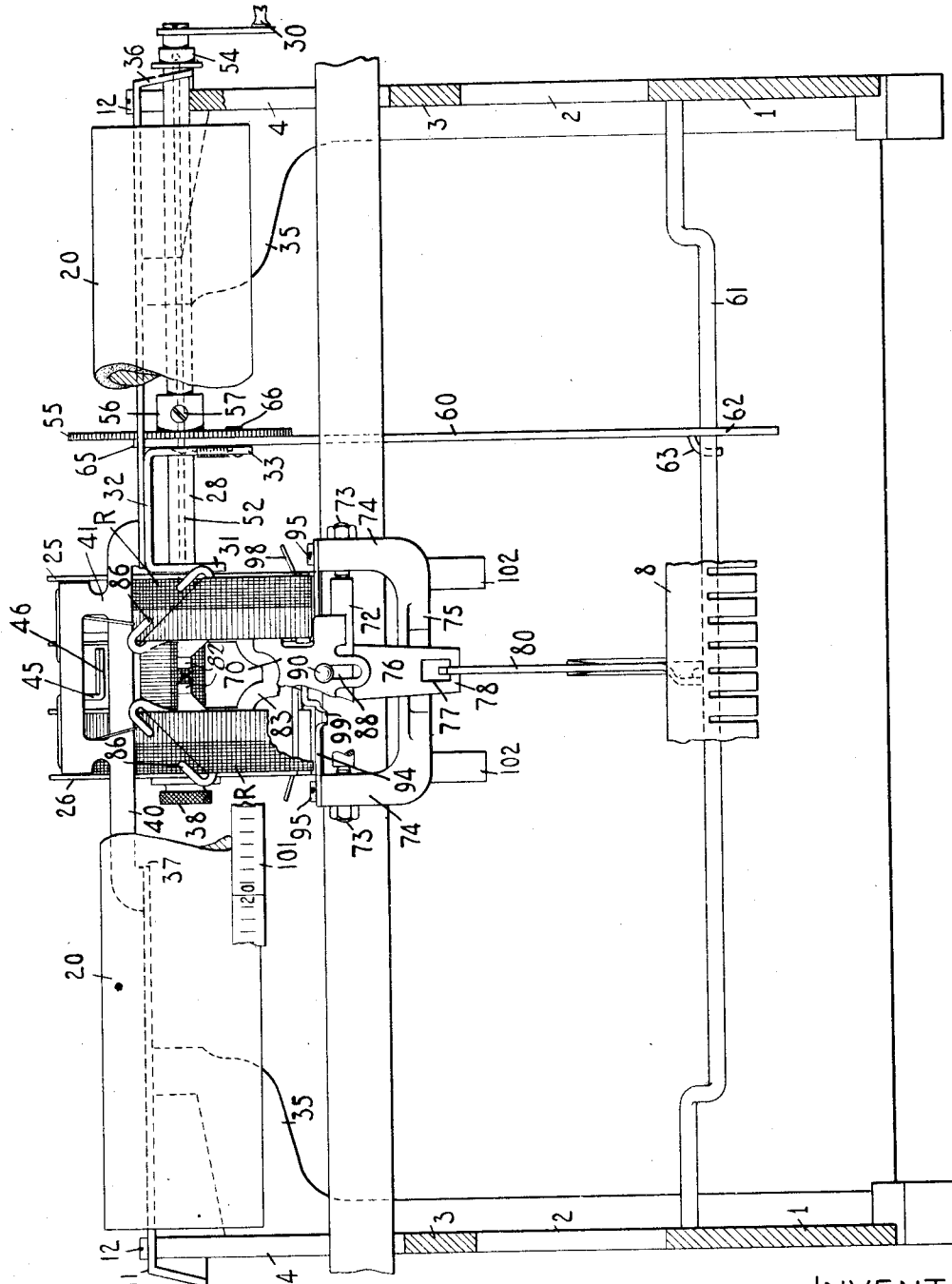
HIS ATTORNEY

H. A. CARHART.  
TYPE WRITING MACHINE.  
APPLICATION FILED AUG. 4, 1913.

Patented Feb. 9, 1915.

3 SHEETS—SHEET 2.

1,127,731.



WITNESSES:

L. Nelson.

R. H. Strother.

FIG. 2.

INVENTOR:

Herbert A. Carhart

By Jacob Fellul

HIS ATTORNEY

H. A. CARHART.  
TYPE WRITING MACHINE.  
APPLICATION FILED AUG. 4, 1913.

1,127,731.

Patented Feb. 9, 1915.

3 SHEETS—SHEET 3.

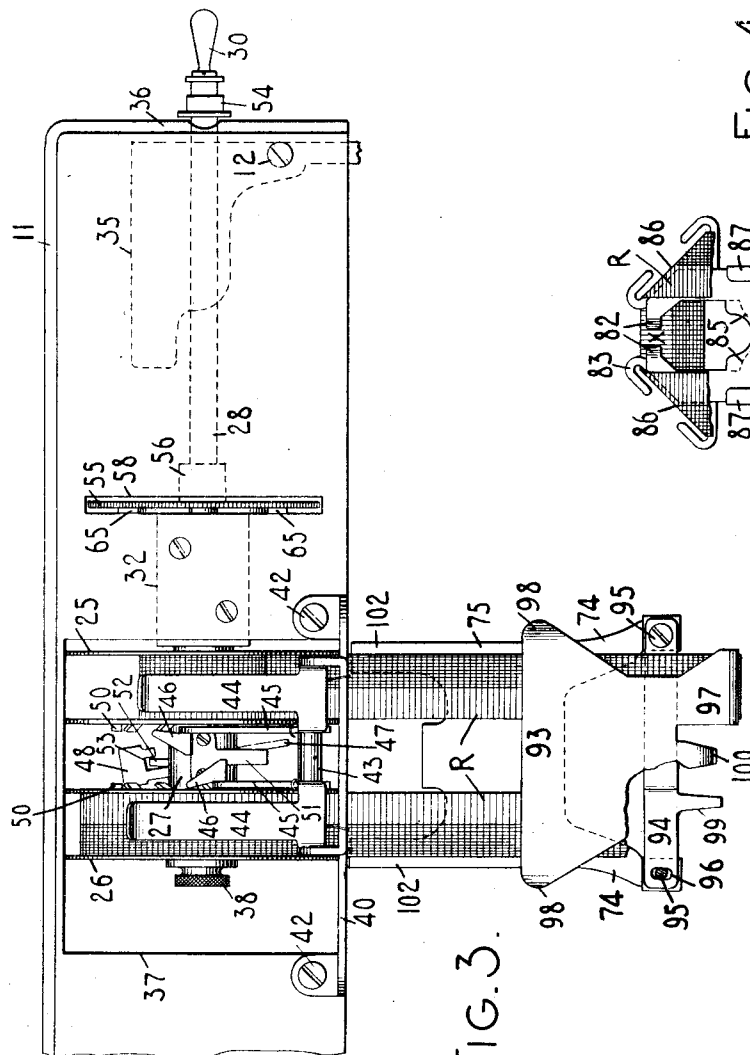


FIG. 3.

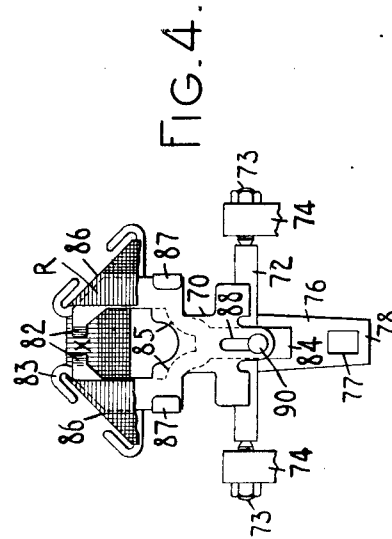


FIG. 4.

WITNESSES:

*L. Nelson*  
*R. Helstetter*

INVENTOR:

*Herbert A. Carhart*  
*By Jacob Felbel*

HIS ATTORNEY

# UNITED STATES PATENT OFFICE.

HERBERT A. CARHART, OF SYRACUSE, NEW YORK, ASSIGNOR TO REMINGTON TYPE-WRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,127,731.

Specification of Letters Patent.

Patented Feb. 9, 1915.

Application filed August 4, 1913. Serial No. 782,950.

*To all whom it may concern:*

Be it known that I, HERBERT A. CARHART, 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 principally to type-writing machines and more particularly to the ribbon mechanism of such machines, but some of the features of my invention are applicable also to printing machines other than typewriters.

The principal object of my invention is to provide improved ink ribbon mechanism for a front-strike typewriter.

Another object is to provide a ribbon vibrator in combination or association with a type guide and having provision for adjustment so as to use different fields of the ink ribbon.

To the above and other ends my invention consists in certain features of construction and combinations and arrangements of parts, all of which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view of a typewriting machine having my invention embodied therein, much of the mechanism of the typewriter being omitted and parts being shortened by breaking. Fig. 2 is a front elevation, partly in vertical section and partly broken away better to show the mechanism. Fig. 3 is a partial top plan view. Fig. 4 is a partial front elevation showing certain parts in different positions from those in which they are shown in Fig. 2.

The main frame of the typewriter shown in the drawings, comprises two side plates each having a base part 1, front and rear corner posts 2, a connecting bar 3, extending from one of said posts to the other, and a rear upstanding bracket or extension 4. These two side plates are connected together by various frame pieces and bars, as for example, a lower rear plate 6, a cross bar 7 near the front of the machine, and a wide horizontal cross bar 8 near the middle of the machine. These parts are also connected by a front top plate 10 and a rear top plate 11, the latter on the upper surfaces of the extensions 4 to which it is secured by

screws 12. Printing keys 13 are arranged in three transverse rows and are mounted on key levers 14 which are pivoted on three wires 15 lying in transverse grooves on the under face of the frame bar 8, and each of said key levers also lies in a fore and aft groove in said bar. It will be perceived that these key levers are of the first order and each of them is provided at its rear end with a returning spring 16. Said levers also are connected at their rear ends with upright push links 17 which, through certain intermediate mechanism, not shown, operate type bars 18, each of which has three types thereon. The type bar mechanism and its supporting and shifting means and the details of the mechanism by which the type bars are actuated, are not shown herein but these parts are shown in co-pending applications of Arthur W. Smith and of Edwin E. Barney. The type bars 18 are adapted to strike against the front face of a platen 20 mounted in a carriage 21 having rails 22, which rails coöperate with anti-friction balls 23, which balls in turn coöperate with a stationary grooved rail 24 supported on the bars 3 of the main frame. It will, of course, be understood that as far as my invention is concerned the carriage can be variously constructed.

A pair of ribbon spools 25 and 26 are mounted on a sleeve or hub 27 which is mounted on and in effect constitutes an enlarged part of a ribbon spool shaft 28. This shaft is located in rear of the platen and just under the rear top plate 11 and it extends from the ribbon spools, which are situated near the middle of the machine, to and beyond the right-hand end of said plate 11, the end of the shaft being provided with a hand crank 30 by which said shaft can be rotated to feed the ribbon by hand. This shaft can be supported in any suitable way but as here shown its inner end is pivoted in a bracket 31 constituting part of an inverted U-shaped piece of sheet metal, the cross or yoke part 32 of which is secured by two screws to the under side of the top plate 11 and which has another branch 33 with an enlarged opening 34 therein through which the shaft passes. The outer end of the shaft can be supported in any suitable way.

The machine shown in the drawings has a bracket 35 projecting inward from the up-

right part 4, this bracket having for its principal function the support of the shiftable segment of the machine. In the present instance this bracket is formed with a groove in its upper surface in which the shaft 28, lies, and the outer end of said shaft is further guided by reason of the fact that it extends through a slot formed in the flange 36 of the top plate 11. When said top plate is removed from the machine by loosening the screws 12, the shaft and spools come off with the top plate, being held at 31. The spools project upward through a square opening 37 in the top plate 11, and it will be noted in Fig. 3 that this opening extends some distance to the left of the left-hand spool 26. Said left-hand spool is removable from the shaft 27, 28, being detachably held on said shaft by a thumb screw 38. If said screw be removed the spool can be removed by sliding it endwise off the shaft and lifting it out of the hole 34. The forward edge of said hole consists of a cross bar 40 having at its ends upright arms 41 by which said bar is supported from the top plate 11, to which top plate it is secured by screws 42. This cross bar 40 supports a pivot rod 43 on which are pivoted two pressure devices or followers 44 which extend from said rod toward the rear and each of which lies on the ribbon on one of the spools. Each of said followers has an arm 45 lying between the two spools and each of said arms terminates in a cam 46. It will be perceived that as the ribbon is exhausted from one of the spools the corresponding follower 44 will drop downward and that the corresponding cam 46 will also drop downward. When the ribbon is nearly exhausted from the spool this cam comes into the path of an arm 47 which constitutes one arm of a lever of the first order, which lever is pivoted in a longitudinal slot in the part 27. The other arm of said lever consists of a dog 48 which is adapted to engage teeth 50 struck out from the inner flanges of the two spools. In the drawing this dog is shown engaging the left-hand spool but when the right-hand cam 46 goes down far enough to strike the arm 47, it will cam said arm toward the left and throw the dog toward the right into engagement with the right-hand spool. This lever 47, 48 is yieldingly retained in either of its two positions by means of a flat spring 51 having its end bent down and made V-shape to engage the arm 47 on one side or the other, depending upon which of the spools is being driven. The shaft 28 is grooved longitudinally and in said groove there lies a wire 52 which wire at its inner end is bent out into a notch 53 in the dog 48. At its outer end said wire is again bent outward, this time to project through a hole in a collar 54 slidably mounted on the end of the shaft 28. The ribbon

feed can be reversed by hand by sliding this collar one way or the other.

The ribbon spool mechanism, thus far described, including the means for driving the spools alternatively from the shaft 28, and both the hand and automatic reverse, are substantially identical with or adaptations of the mechanism heretofore in use in the Smith Premier typewriter and shown in the patent to Alexander T. Brown No. 974,353, dated November 1st, 1910 and in the patent to A. J. Briggs, No. 947,276, dated January 25, 1910. I therefore do not claim anything of especial novelty in these devices; and as far as the main features of my invention are concerned, some other form of ribbon spool and reverse mechanism can be substituted for this if preferred. I have, however, provided novel means for driving the shaft 28. I mount a fine-toothed ratchet wheel 55 on the shaft 28 by means of its hub 56, which hub is secured on said shaft by means of a set screw 57. The ratchet wheel 55 is mounted a short distance to the right of the bracket 33 and it projects upward through a slot 58 in the top plate 11. This ratchet wheel is engaged by a pawl 60, which pawl is pivoted to a part that reciprocates at the key strokes. In the present instance, and preferably said pawl is pivotally mounted directly on the universal bar 61 of the machine which bar is here shown as consisting of a round rod or heavy wire bent into a yoke shape, as shown, and pivoted at its ends in the side plates or bars 1. The pawl 60 is detachably pivoted on the part 61 by the following means: At its lower end said pawl has a branch or arm 62 that partially embraces the rod 61 as shown in Fig. 1, this branch in the present instance extending down in front of the bar. Said pawl is formed with another branch 63 which, as shown in Fig. 1, extends down behind the bar 61. As shown in Fig. 2, however, this branch above the bar 61 is bent off sharply toward the left and it thence curves downward behind the bar. The construction is such that when the pawl is mounted in the machine, as shown in the drawings, it takes a good and firm pivotal bearing on the universal bar, but by giving the pawl a twisting or turning movement about its longitudinal axis, the off-set arm 63 can be caused to lie flatwise against the rear face of the bar and the branch 62 to lie flatwise against the front face of the bar and in that position the pawl can be lifted off the bar with ease. The pawl can also be placed in position on the bar by a reversal of the process described. Means are provided for normally preventing these twisting or turning movements of the pawl so as to keep the pawl normally nicely pivoted on the bar. To this end the pawl lies between the ratchet wheel 55 and the bracket 33, that

is to say, said pawl has a branch 64 that lies in that position. Said pawl also has two upwardly projecting ears 65, one in front of the shaft 28 and consisting of a forward and upward prolongation of the branch 64, and the other projecting upward in the rear of said shaft 28; and these two ears lie in the slot 58 in such position that the pawl is free to move up and down but is held against the twisting movements referred to. It will be understood that the turning or twisting movements referred to, are relative movements and that the pawl can be disconnected by turning the universal bar itself, first detaching said bar from its pivots. The pawl is made of sheet metal as will be perceived, and the part of it that engages the ratchet wheel consists of a tooth 66 bent off from one side of the body of the pawl. The ratchet wheel is also engaged by a retaining pawl 67 pivoted to the flange of the top plate 11, and engaging the wheel by gravity. A restoring spring 68 is connected at one end to a projecting ear of the bracket 33 and at the other end to the pawl 60, the line of pull of this spring being, as shown, in a direction downward and toward the front of the machine, said line passing in front of the universal bar 61 to which the pawl is pivoted. As the line of pull of the spring passes in front of the universal bar, the tendency is partly to act as a restoring spring for the pawl and also for the universal bar itself, and partly to turn the pawl toward the front of the machine about the universal bar as a pivot. This spring therefore acts as a returning spring for the pawl and universal bar and it also acts to hold the tooth 66 yieldingly in engagement with the wheel. As the line of pull of the spring 68 when extended passes a comparatively short distance in front of the bar 61 the tendency of said spring to restore the pawl and universal bar is much stronger than its tendency to press the tooth 66 against the wheel.

It will, of course, be understood that the universal bar 61 lies above the rear arms of the several printing key levers so that said universal bar is moved upward at each operation of a printing key. The branch 62 is prolonged downward as shown so that it stands between two consecutive key levers 14 and serves to prevent displacement of the pawl lengthwise of the universal bar.

The mechanism for vibrating the ribbon at the type strokes, comprises a vibratory device or lever 70 extending up in front of the platen as shown and having below the platen a rearwardly extending arm 71 rigidly mounted on an axle 72 which is suitably pivoted in the stationary framework. In the present instance, said axle is pivoted on coiled screws 73 threaded through branches 74 of a bracket or frame 75 which is secured

by means of two screws to the under side of the stationary carriage rail 24. The branches 74 of this bracket or frame part, extend forward and thence upward to a suitable point beneath the platen where the axle 72 is pivoted therein. The lever 70 has an arm 76, Fig. 1, projecting downward from the axle 72 and formed out of the same piece of sheet metal as the remainder of this lever. At its lower end the arm 76 is cut out at 77 so as to form at the extreme end of the arm a sort of cross bar 78 that normally lies in a notch or open-ended slot in the upper end of an angled lever 80, which lever is pivoted at 81 in ears projecting toward the rear from the frame bar 8. Said lever has a rearwardly directed arm that lies across the top of the universal bar 61, so that said lever is rocked at each operation of said universal bar. When the universal bar is moved upward by the depression of a printing key, the upper arm of the lever 80 moves toward the front of the machine and causes the upper arm of the lever 70 to move toward the rear. Said lever 70 normally drops by its own weight far enough forward to leave the writing plainly visible, notwithstanding the ribbon and ribbon guide which are carried by said lever, as will presently appear. The upper arm of the lever 70 is forked as shown in the drawings and the two branches of it approach each other and are bent inward to form type guides 82 between which the type blocks on the ends of the type bars 18 are adapted to pass and by which the types are guided with precision to the printing point, which printing point, as viewed from the front of the machine, stands directly between the two inclined guides 82.

A ribbon guide or vibrator 83 mounted on the lever 70, consists of a piece of resilient sheet metal stamped out with a stem 84 and two branches 85, each branch terminating in an angled ribbon guide 86 whereby the ribbon can be led up in front of one of said branches, thence across from one branch to the other back of the vibrator and across the printing point, and thence downward in front of the other branch of the ribbon guide and of the lever 70, all as will be understood from Fig. 4. In order to provide for using different fields of the ribbon, the ribbon guide 83 is arranged to be moved up and down on the lever 70. To this end each of the branches 85 has an ear 87 projecting therefrom and said ears are bent around the outside edges of the branches of the lever 70 in such a way as to act as guides whereby the ribbon guide can be slid up and down on said lever. The stem 84 of the ribbon guide is bent toward the rear and thence downward as shown in Fig. 1 and at the extreme bottom thereof said stem is bent back upon itself so that the end projects upward

just in the rear of the lever 70. At that point said lever is formed with an elongated slot 88 through which projects the shank of a button 90, the inner end of which is riveted into the upturned end of the stem 84. This button is capable of moving up and down in the slot 88 thus guiding the stem of the ribbon guide and limiting the up and down motion thereof. When the button is set in its lowermost position, shown in Fig. 4, the upper part of the ribbon lies across the printing point, and, if the ribbon has two colors of ink thereon as shown in the drawings, the printing will be from the upper stripe or color. When, on the other hand, the button 90 is set in the upper end of the slot as shown in Fig. 1, then the printing is from the lower stripe of the ribbon.

I prefer to form the extreme end of the stem 84 as shown in Fig. 2 with a V-shaped fold 91 therein, which fold presses frictionally against the rear surface of the lever 70. The frictional restraint due to the elasticity of the ribbon guide is sufficient to hold it in either of its two extreme positions and indeed in any position to which it is set. It is sometimes desirable in a ribbon having only one color of ink to set the guide in the middle position so as to use up the ink along the center of the ribbon. In order to facilitate this exact adjustment a slight cross-notch is formed in the rear face of the lever 70 in such position that the V-shaped fold 91 enters said notch when the ribbon guide is in the middle position and offers enough resistance to the up and down motion of the guide to enable the operator to recognize the position and to set the guide there if he so desires.

The ribbon is guided from the spools to the vibrator under a guide 93, consisting, as shown in Fig. 3, of a broad piece of sheet metal which, as shown in Fig. 1, lies beneath the platen and projects back part way above the carriage rail 22. It will be perceived that the ribbon is conducted from the spools forward above said rail and beneath the platen and thence upward to the vibratory ribbon guide. The plate 93 is supported in a manner best shown in Figs. 1 and 2, where it will be seen that a cross bar 94 is fastened at its ends to the upper ends of the arms 74, where it is secured by means of screws 95 which screws, as shown in Fig. 3, pass through slots 96 in the ends of the bar 94, said slots, for a reason presently to be explained, being elongated in a front and back direction. The bar 94 is formed with two double bends as will be understood from Fig. 2, so that its middle section stands in a higher plane than the end sections of said bar and the plate 93 is mounted on and rigidly secured to this elevated middle section. Said plate is formed with two forwardly projecting branches 97, each of

which at its front end is bent upward as shown in Fig. 1 to make a curved surface for the ribbon to run under. It will be perceived that the ribbon is guided above the bar 94 and beneath the plate 93, the middle elevated section of said bar being situated between the two lines of ribbon. Preferably the right and left-hand rear corners of the plate 93 are turned up as shown at 98 in order to facilitate the insertion of the ribbon under the plate. It will be perceived that the machine can be threaded by drawing a loop of the ribbon forward from the two spools beneath the plate 93 and above the bar 94 until said loop comes in front of the vibrator and then hooking the two parts of the loop down into the guides 86 in such a way that the middle section of the loop comes behind the vibrator. One or both of the end sections of the bar 94 is formed with a forwardly projecting arm 99, adapted to serve as a stop to limit the rearward movement of the vibrating lever 70. The slots 96 are elongated as described above, for the purpose of providing a suitable adjustment for these stops. It will be perceived that said stops constitute parts of a ribbon guiding device, which device is moved with the stops when the latter are adjusted. Between the two branches 97 the plate 93 is formed with a forwardly projecting arm 100 which is situated directly beneath the printing point and constitutes a pointer to co-operate with a scale plate 101 which can be of any suitable construction and mounted on the carriage in any suitable way.

In the present instance the bracket or frame piece 75 is shown with two rearwardly directed arms 102 between which there is pivoted the axle 103 of an escapement rocker 104, which rocker carries feed dogs 105 coöperating with a feed rack 106, which rack is mounted on the rear ends of arms 107 pivoted at 108 to the carriage 21. The rocker 104 has a downwardly projecting arm 110 which is adapted to be struck by an arm 111 projecting upward from the universal bar 61. The machine is also shown equipped with a space key or bar 112 mounted on arms 113 which arms are rigidly connected with a rock shaft 114 in the base of the machine and from said rock shaft an arm 115 projects toward the rear and lies beneath the universal bar 61 in a position to operate said universal bar. Of course, it will be understood that any other form of carriage feed and space key mechanism can be provided. It will also be understood that various changes can be made in the details of construction and arrangement without departing from my invention.

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

1. The combination of a ribbon vibrator, a ribbon guiding device, means for actu

ating said vibrator, a stop for said vibrator formed as a part of said guiding device, and means for affording an adjustment of said guiding device and stop.

5 2. The combination of a ribbon vibrator, means for actuating said vibrator, and a device that constitutes a ribbon guide and also a stop for said vibrator.

3. The combination of a platen, a ribbon 10 vibrator, ribbon spools located behind the platen, a ribbon guide for guiding the ribbon from said spools beneath the platen to said vibrator, and means associated with 15 vibrator for arresting the motion of said vibrator.

4. The combination of a series of printing keys, a universal bar operated by said keys, spools for an ink ribbon, and means 20 for turning said spools comprising a ratchet wheel and a pawl for said ratchet wheel, said pawl having an arm or branch thereof partially embracing said universal bar and another arm or branch off-set from the first 25 whereby said pawl can be pivotally mounted on said bar and removed from said bar by twisting or turning movements.

5. The combination of a series of printing keys, a universal bar operated by said keys, spools for an ink ribbon, and means for 30 turning said spools comprising a ratchet wheel and a pawl for said ratchet wheel, said pawl having an arm or branch thereof partially embracing said universal bar and another arm or branch off-set from the first 35 whereby said pawl can be pivotally mounted on said bar and removed from said bar by twisting or turning movements, and guiding means normally preventing such turning or twisting movements.

40 6. The combination of a series of keys, a part reciprocated by said keys, a sheet metal pawl having one branch that partially embraces said part and another branch off-set therefrom whereby said pawl can be pivotally 45 ally mounted on and removed from said part by twisting or turning movements, a ratchet wheel engaged by said pawl, a sta-

tionary part between which and said ratchet wheel said pawl plays to prevent twisting or turning movements of said pawl, and a 50 ribbon spool driven by said ratchet wheel.

7. The combination of a ribbon vibrator, a scale plate, and an adjustable device constituting a ribbon guide, a vibrator stop, 55 and a pointer.

8. In a typewriting machine, the combination with printing keys and a universal bar in the base of the machine, of a top 60 plate, a ribbon spool in the upper part of the machine and having a shaft near said top plate and having a ratchet wheel for turning said spool, and a pawl extending upward from said universal bar and engaging 65 said ratchet wheel, said pawl guided on opposite sides of the shaft in said top plate.

9. In a typewriting machine having a track-way for the carriage and having a ribbon vibrator in front of said track-way 70 and ribbon spools in rear of said track-way, the combination of printing keys and a universal bar in the base of the machine, means connecting said vibrator with said universal bar, a pawl extending from said 75 universal bar to drive said ribbon spools, and means for guiding a ribbon from said spools to said vibrator.

10. The combination with the printing keys, of a pair of ribbon spools, a shaft 80 common to said spools, means for connecting said spools with said shaft alternatively to be driven thereby, and means for turning said shaft always in the same direction, said turning means comprising a uni- 85 versal bar and a pawl mounted directly on said universal bar and engaging said ratchet wheel.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 31st day of July A. D. 1913.

HERBERT A. CARHART.

Witnesses:

WILLIAM H. EBELHORE,  
VALENTINE J. KITTER.