Nov. 7, 1939. W. F. HELMOND 2,178,688

TYPEWRITING MACHINE

Filed March 16, 1936 4 Sheets-Sheet 1

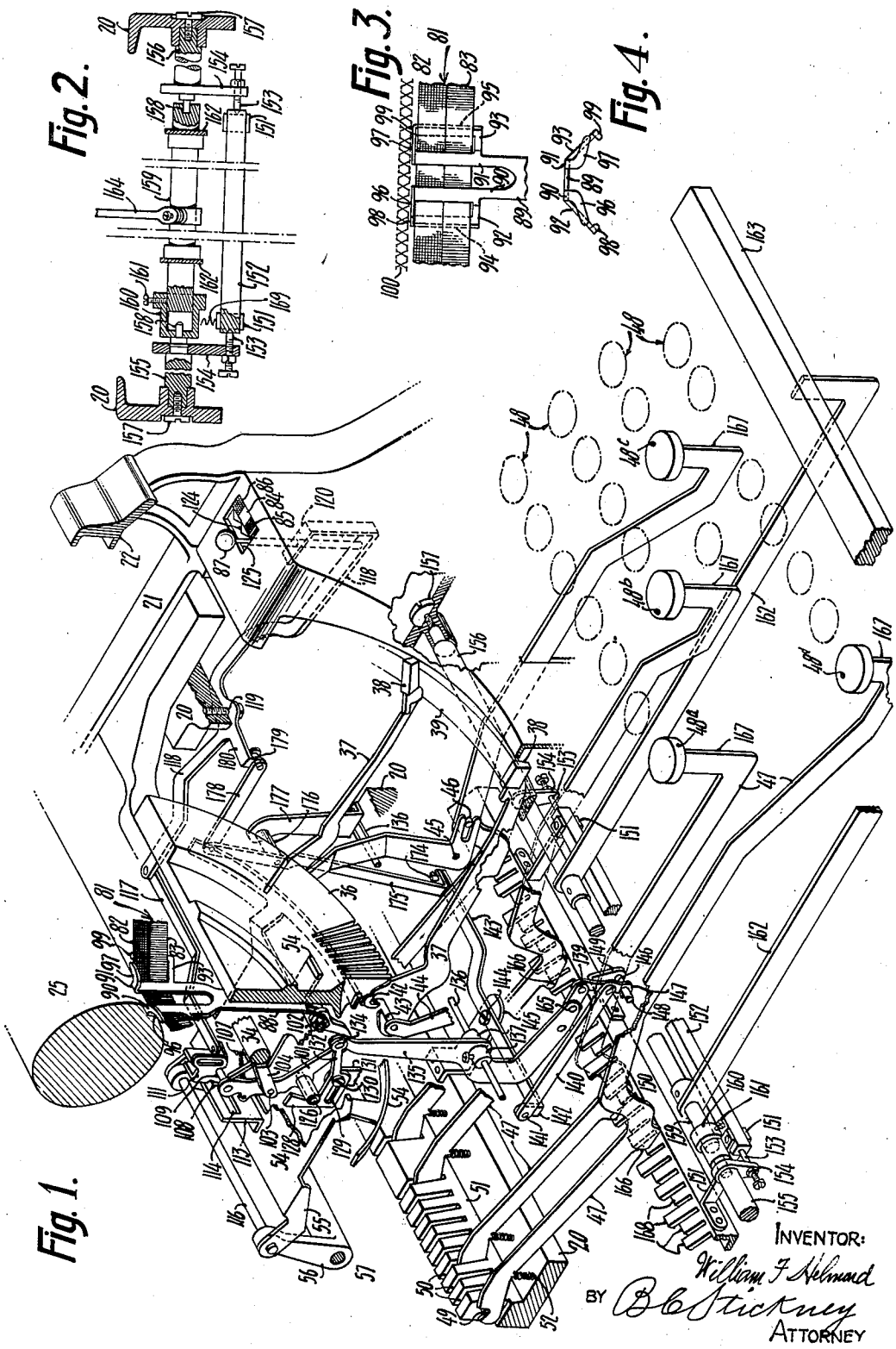


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

INVENTOR:
William F. Helmond
BY B. C. Stickney
ATTORNEY

Nov. 7, 1939. W. F. HELMOND 2,178,688

TYPEWRITING MACHINE

Filed March 16, 1936 4 Sheets-Sheet 2

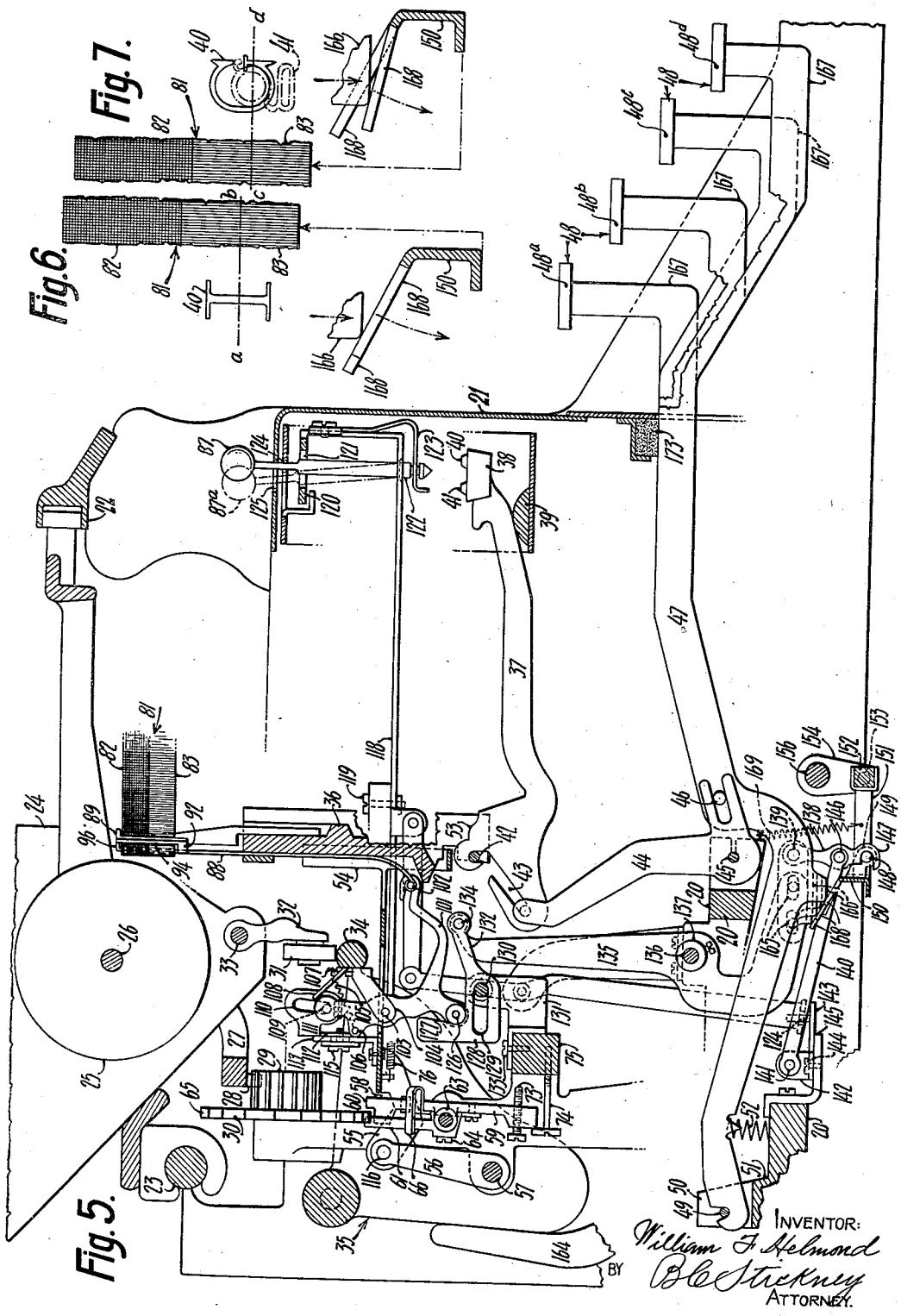


Fig. 5.

Fig. 6.

Fig. 7.

INVENTOR:
William F. Helmond
BY
B. C. Stuckney
ATTORNEY.

Nov. 7, 1939. W. F. HELMOND 2,178,688

TYPEWRITING MACHINE

Filed March 16, 1936 4 Sheets-Sheet 3

Fig. 8.

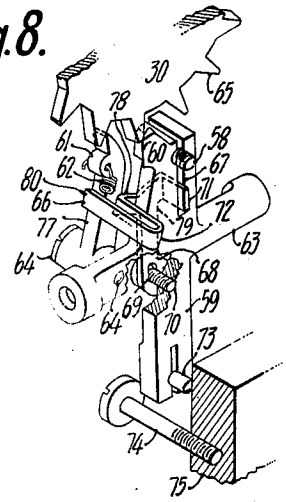


Fig. 9.

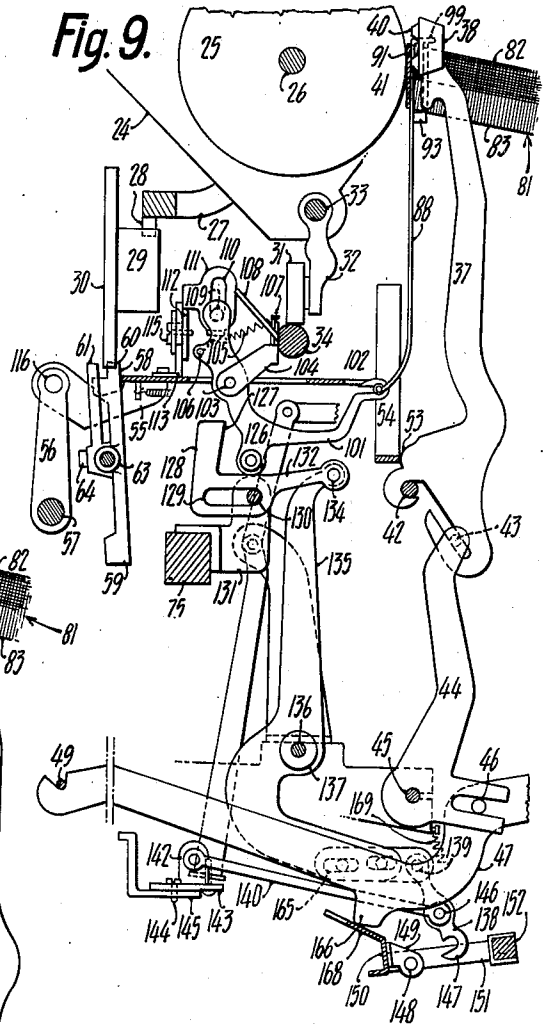
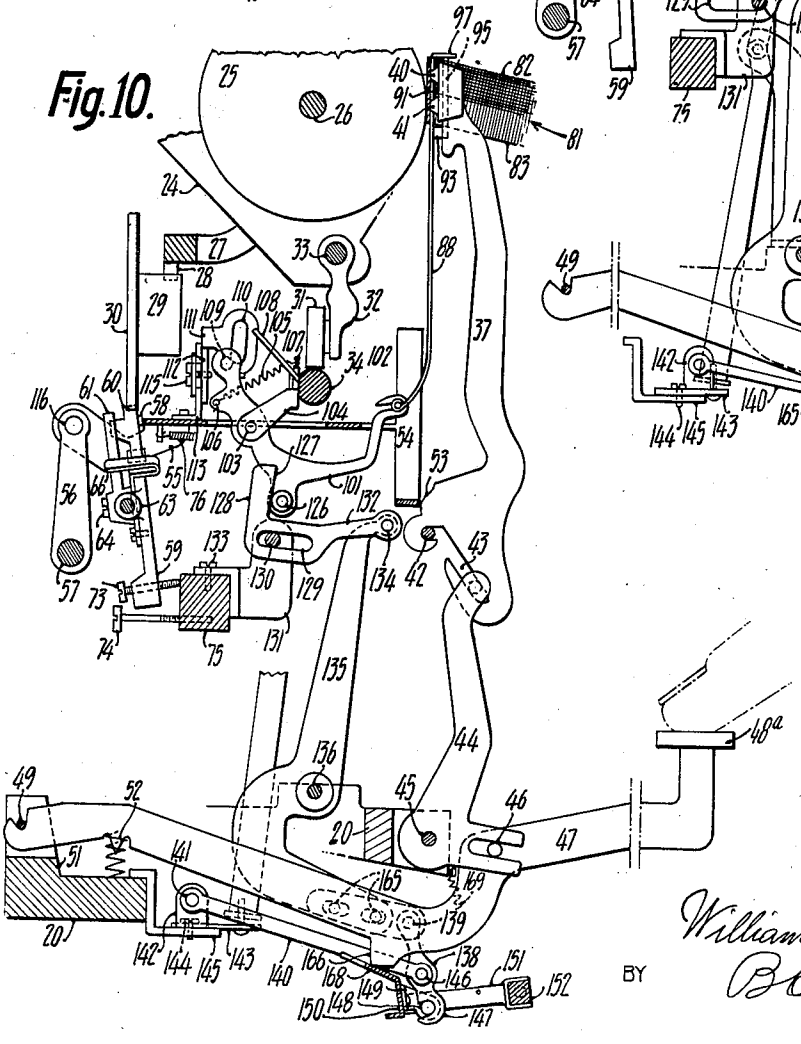


Fig. 10.



INVENTOR.
William F. Helmond
BY B. B. Stickney
ATTORNEY.

Nov. 7, 1939. W. F. HELMOND 2,178,688

TYPEWRITING MACHINE

Filed March 16, 1936 4 Sheets-Sheet 4

Fig. 11.

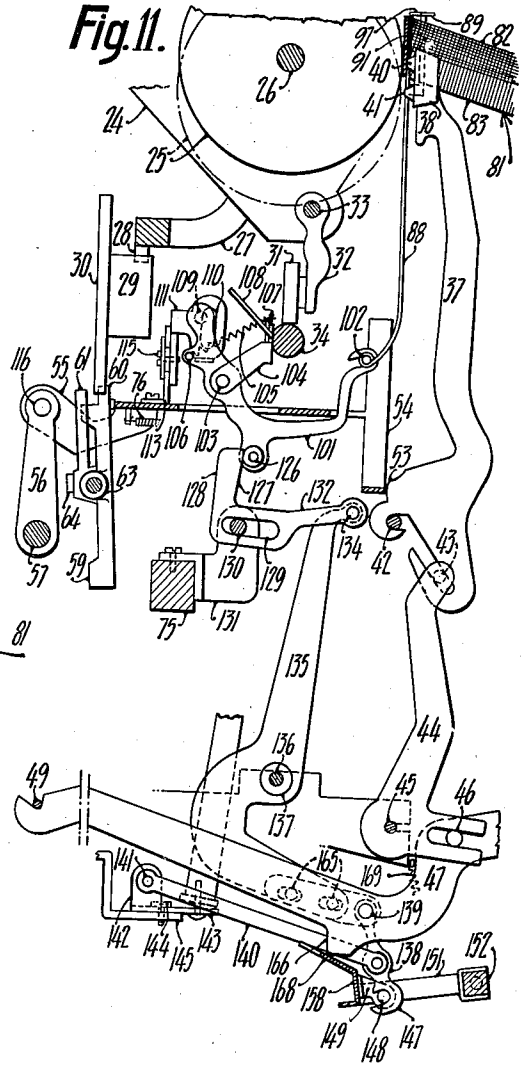
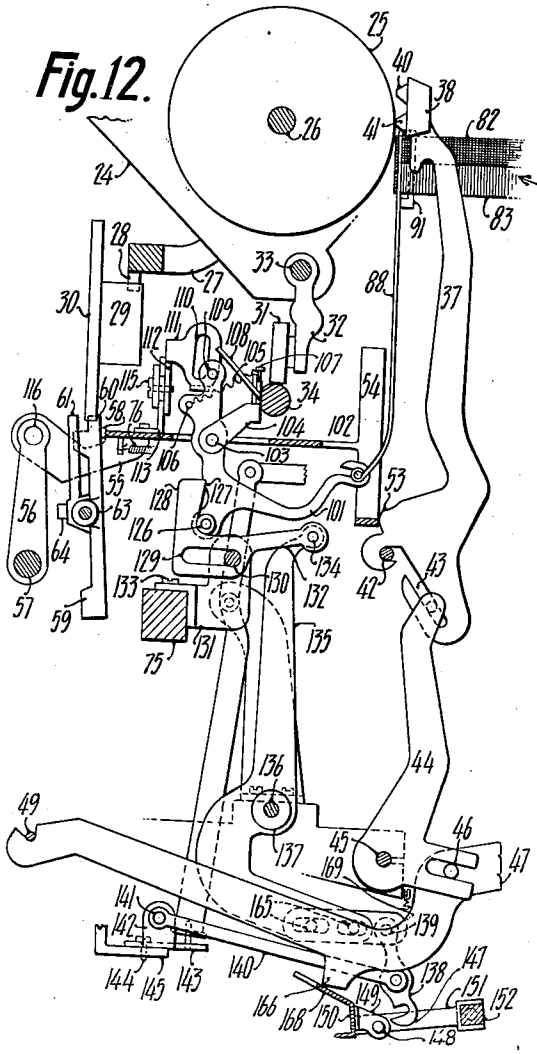


Fig. 12.



INVENTOR:
William F. Helmond
BY
B. B. Stickney
ATTORNEY.

Patented Nov. 7, 1939

2,178,688

UNITED STATES PATENT OFFICE

2,178,688

TYPEWRITING MACHINE

William F. Helmond, West Hartford, Conn., assignor to Underwood Elliott Fisher Company, New York, N. Y., a corporation of Delaware

Application March 16, 1936, Serial No. 69,130

14 Claims. (Cl. 197—157)

This invention relates to typewriters and more especially to improvements in bichrome-ribbon shifting and vibrating mechanisms.

A difficulty heretofore experienced with bichrome-ribbon mechanisms is the imprinting on work-sheets of characters in part the selected color and in part the other color of a bichrome-ribbon, or a character may be imprinted only in part. This result in this art is commonly called "bleeding".

Another cause of "bleeding" is the crinkling or wrinkling, especially of the lower field or part, or of what is usually the "red" field or part, of the ribbon.

A feature of the invention is the provision of a ribbon-vibrating mechanism, having one universal bar actuable by type-operating mechanisms or trains to vibrate the ribbon-vibrator to present one lengthwise band or field of a ribbon in front of the printing position, and a second universal bar actuable by the said trains to vibrate the ribbon-vibrator to present another lengthwise band of the ribbon in front of the printing position.

Another and related feature of the invention is the provision of predeterminately settable devices for operatively connecting the ribbon-vibrating mechanism selectively with either one of the universal bars, and for operatively disconnecting said vibrating mechanism from both universal bars. In the disconnected position of said vibrating mechanism the typewriter may be used for stenciling.

Another feature of the invention is the provision of mechanism in a typewriter for moving the ribbon-vibrator upwardly concomitantly and synchronously with the movement of the key-levers throughout their down stroke. This mechanism may include a universal bar mounted in the frame of the typewriter under and across the key-levers and actuable directly by the key-levers, and also may include on the universal bar parts proportioned to the varying distance of the key-levers in the several banks from the universal bar, and under and engageable with each key-lever, each part being capable of a simple, facile, and accessible adjustment, whereby the movement of the ribbon-vibrator may be adjusted for any or for all of the characters, lessening the extent of movement of the universal bars under the key-levers that carry the characters that cause the most trouble, and especially those having depending tails.

These adjustable parts, mounted on the universal bar, may be metal tongues of different lengths; the length being varied for key-levers in different key-banks, and each tongue being easily bent for facile adjustment with reference to the coengaging key-lever.

Another feature of the invention is the easy accessibility of the adjustments connected with the universal bar.

Another feature is the shortening of the letter-spacebar shaft, whereby the shaft is stiffened and made more rigid and less yieldable, and easily assembled and adjusted.

A further feature of the invention is the provision of a new and improved ribbon-vibrator having a very thin upper transverse or horizontal retaining and guiding edge, whereby the initial normal position of the ribbon-guide is raised, and the amount of movement necessary to interpose the ribbon in the printing position, or to remove it to the inoperative position, is lessened and reduced without impairing the normal visibility of the printing line on a work-sheet. This shortening of the total vibratory movement, in and of itself, obviates the liability of "bleeding" on a work-sheet in using a bichrome-ribbon.

A feature of the improved vibrator is two vertical spaced-apart guides having thin top edges turned over horizontally, all formed from an integral piece of sheet-metal entirely free from cracks in the surface which may be liable to engage and tear threads in the ribbon.

Another feature of improvement pertains to mechanism for quietly arresting the escape and the swing of the limber-dog of the letter-feed escapement, and for this purpose a novel reflexed sound-muffling leaf-spring is provided, and said spring may moreover be adjustably secured to the dog-rocker by but one screw, inasmuch as it may be provided with an anchoring tongue spaced from said one screw and inserted in a kerf usually provided on the dog-rocker. This feature is also shown in my co-pending application Serial No. 3,037, filed January 23, 1935 (now Patent No. 2,044,002, dated June 16, 1936).

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a perspective view, partly broken away.

Figure 2 is an elevation, partly in section and with parts broken away, of a cross-bar supporting a universal bar beneath the key-levers, and the letter-spacer mounting.

Figure 3 is a front elevation of the improved ribbon-guide.

Figure 4 is a plan view of the improved ribbon-guide.

Figure 5 is a side elevation, partly in section.

Figure 6 is a diagrammatic view showing the position of the bichrome-ribbon when the capital letter "I" is imprinted in red, and also the position of the key-lever extension in contact with the corresponding tongue on the universal bar, the arrow-heads indicating the directions of the operating movements.

Figure 7 is a diagrammatic view showing the position of the bichrome-ribbon when the capital letter "G" is imprinted in red, and also the position of the key-lever extension in its normal operative position above the corresponding downwardly-flexed tongue on the universal bar, the arrow-heads indicating the directions of the operating movements.

Figure 8 is a perspective view of the improved silencer for the limber-dog of the escapement-rocker.

Figure 9 is a side elevation, partly in section, showing the operative position of the black band of a bichrome-ribbon while a small or lower-case type is in contact with the platen, the guide being raised by the usual type-bar-actuated segmental universal bar, some parts being shown only diagrammatically.

Figure 10 is a side elevation, partly in section, showing the operative position of the red band of a bichrome-ribbon while a small or lower-case type is in contact with the platen, the guide being raised by the improved key-lever-actuated universal bar, some parts being shown only diagrammatically.

Figure 11 is a side elevation, partly in section, showing the operative position of the red band of a bichrome-ribbon while a capital or upper-case type is in contact with the platen, the guide being raised by the improved key-lever-actuated universal bar, some parts being shown only diagrammatically.

Figure 12 is a side elevation, partly in section, showing the neutral, or stenciling position of the ribbon, both the red and the black ribbon-positioning mechanism being disconnected, some parts being shown only diagrammatically.

The usual typewriter-frame **20** has a mask **21**, a front rail **22**, and a rear rail **23**, a carriage **24** being movably mounted on the rails. A platen **25** is rotatably mounted on the carriage **24** by means of a shaft **26**. A rearwardly-extending arm **27** is attached to the platen-carriage and supports a rack **28**, which overlies and engages a pinion **29** on an escapement-wheel **30**.

A roller **31** is rotatably mounted on a depending arm **32**, which is rotatably mounted on a rod **33** transversely mounted in the lower part of the carriage **24**. A shift-rail **34** for shifting the platen **25** to the upper-case position is engaged by the roller **31**, and is mounted on a shift-rail support **35**.

A type-segment **36** supports type-bars **37**, of a multiple system of type-operating trains. Each type-bar has a type-bar head **38** which, in the inoperative position, lies on a cushioned rest segment **39**, as clearly shown in Figure 5. A type-bar-supporting rod **42** passes through an arc of the segment and supports each type-bar **37** rotatably. Each type-bar operating train may include a sub-lever **44** rotatably mounted on a supporting rod **45**, having a pin-and-slot connection **43** with a type-bar **37**. The sub-levers **44** are actuated, through key-levers **48** by pin-and-slot connections **46** at the depression of the associated keys **48** to raise the type-bars from inoperative position to the upright position clearly shown in Figure 9.

Referring to Figure 1 and to Figure 5, there are four rows or banks of typewriter-keys designated from top to bottom **48a**, **48b**, **48c** and **48d**. At the rear of the frame a rod **49** engages a groove in each key-lever **47**, the rear extremities of the key-levers lying in slots **50**, which are cut in a bar **51**. A coil-spring **52** mounted on the frame **20** tensionally supports each key-lever.

The feed-rack **28** on the carriage, the pinion **29**, escapement-wheel **30** and dogs **60**, **61** co-operate to letter-feed the carriage upon actuation of a universal bar **54** by cams **53** on type-bars **37** carrying heads having upper-case or capital-letter and lower-case or small-letter types **40** and **41**, respectively, the usual carriage-feeding spring-motor not being shown. The universal bar **54** has a supporting extension **55** pivoted to an arm **56** at **116**, the arm **56** being rotatably mounted on a shaft **57**. A spring **76** (Figure 5) tends to return the universal bar to the initial position. The limber-dog **61** (Figure 8) of the escapement-device is mounted on a pivot-screw **64** in an escapement rocker-arm **63**, which extends from the sides of the usual dog-rocker **59** upon which the dog **60** is fixed.

The universal bar **54** has a rearward extension which engages an adjustable screw-stud **58** on the dog-rocker to actuate the latter. For binding said screw-stud **58** in its adjusted position, the screw-hole in the dog-rocker **59** is centrally intercepted by a kerf **67**. An adjustment screw **73** is carried by the lower end of the dog-rocker **59** and engages the rear wall of a square cross-piece **75** as a stop, and the head of a screw **74** secured in the cross-piece **75** limits the dog-rocker **59** in the opposite direction.

Near the end of its rearward stroke the universal bar **54** engages the screw **58** and rocks the dog-rocker **59** to the position shown in Figure 8, to permit the escape of the limber-dog **61** preparatory to a carriage-feeding letter-space stop. A spring **62** has one end attached to the limber-dog **61** and another end to the frame of the escapement (not shown), as is well known in the art, and therefore holds the dog **61** under constant spring-tension both in the direction of the swing of the dog **61** and towards ratchet-teeth **65**. For quietly arresting the escape and the swing of the limber-dog **61**, a novel stop-silencer **66** is provided, which may be easily adjusted to regulate the extent of the swing of the limber-dog **61**. Said stop may be arranged as follows: The stop-silencer **66** of spring sheet-material has a dog-stopping extremity **80**, which is a narrow strip and is rendered resilient, for sound-deadening purposes, by extending from a body-part **79** by way of reflex bends **78**, **72**, said body-part **79** being mounted against the rear face of the dog-rocker **59**. Means for adjustably securing the limber-dog silencer **66** to the dog-rocker **59** include only one binding screw **70**, since the body-part **79** of said stop-silencer **66** may have bent therefrom an anchoring tongue **71**, which, by its disposition within the upper dog-rocker kerf **67**, co-operates with said binding screw **70** to hold said stop-silencer **66**. Said tongue **71** may be moved along said kerf **67** for vertical adjustment of the stop-silencer **66** in a direction which will be appropriate for effecting either an increase or decrease of the swing of the limber-dog **61**, since a stop-face **77** of said limber-dog **61** is inclined to the dog-rocker **59** or to said kerf **67**. There-

fore, adjustment of the stop-silencer 66 up or down, as directed by said kerf 67, will move its dog-stopping extremity 80 toward or from, respectively, said inclined stop-face 77. A screw-hole 69, in the lower extremity 68 of the body-part 79, for the binding screw 70, is vertically elongated to permit such up-and-down adjustment of the stop-member, and the body-part 79 of the stop-silencer 66 may be arranged to space the binding screw 70 from the anchoring tongue 71. Adjustment of the limber-dog stop 66 involves loosening and tightening of only said single binding screw 70, and this screw 70 is facilely accessible from the back of the machine. It is now clear that I have provided quiet operation for an escapement by combining with a dog-rocker and a spring-tensioned limber-dog pivoted thereon for idle escape and pivotal swinging under the urge of its spring at operation of the dog-docker, a sound-muffling resilient and adjustable stop for quietly arresting said limber-dog.

A bichrome-ribbon 81 has an upper lengthwise black band or field 82 and a lower red band 83. An index on the front of the typewriter, as shown in Figure 1, indicates the three settings of the ribbon-vibrator, namely, the neutral setting 84 in white which is also called the stenciling position, the red setting 85, and the black setting 86. The setting of an operating lever 87 proximate any index position places the mechanism in operative position for the indicated condition.

A ribbon-vibrator 88 may include at the upper end a ribbon-guide 89, which may be formed from a single unitary thin piece of metal centrally bifurcated for the passage of the type-bar heads and formed into thin vertical forks 90 at the left and 91 at the right, as clearly shown in Figure 3. Proceeding at right angles and outwardly and forwardly from the fork 90 is an extension 92, and similarly on the fork 91 is an extension 93 similar to extension 92, but symmetrically opposite thereto. Rising from the extremity of the extension 92 is a left vertical guide-post 94, and opposite and symmetrically thereto is a right vertical guide-post 95 rising from the extremity of the guide-extension 93. The top of the left vertical fork 90 has a horizontally and forwardly and outwardly extending guide-piece 96 which overlies the extension 92, forming a stop and guide, which prevents the ribbon rising on the guide above and beyond the position of the guide-piece 96. A top of the fork 91, opposite to and symmetrically positioned with reference to the guide-piece 96, has a similar guide-piece 97 overlying the extension 93 and similarly acting on the right side of the ribbon-guide, in the manner and for the purposes already set forth with reference to the piece 96.

The left vertical guide-post 94 at the top has a short forwardly-extending horizontal piece 98 which acts also as a stop and a guide for the top edge of the bichrome-ribbon 81. The right vertical post 95 also has a similar forwardly-extending small piece 99, which also acts as a guide and stop for the top edge of the ribbon 81.

By referring to Figure 4, it is clear that the guide-pieces 96 and 97 are spaced from the extensions 98 and 99, so that, by turning a ribbon in a vertical position crosswise to the normal direction of travel through the guide 89, the ribbon is easily inserted through the guide 89 on either side thereof, so that in the normal operative position of the guide 89, the ribbon feeds in front of the vertical guide-posts 94 and 95 and in the rear of the vertical forks 90 and 91, in a manner well known to those familiar with the art of typewriters.

As clearly shown in Figure 3, this improved construction permits a design of typewriter with the ribbon-guide 89 approximately at the bottom of a line of printing 100 on a work-sheet, and, as compared with ribbon-vibrators now in use in the art, it therefore reduces the amount of movement necessary to raise the ribbon to the operative position between a type and a work-sheet. The fact that the ribbon-guide is made throughout of very thin metal conduces to decrease the amount of superstructure for the ribbon-guide, so as to lessen the amount of movement of the vibrator without decreasing the visibility of the line of printing. Another utility derived from the unitary construction is the freedom from irregularities in the surface or cracks in the construction, which would make a liability to tear any of the threads of the typewriter-ribbon.

A lever 101 for vibrating the ribbon (see Figure 5) has a pivotal open-slot connection 102 with the thin metal ribbon-vibrator 88 on the top of which the guide 89 is mounted. A pivoted pin 103 secures the arm 101 on a supporting arm 104 depending downwardly and rearwardly from the back of the shift-rail 34. A tension spring 105 pinned on the lever 101 at 106 is also pinned to the shift-rail 34 at 107. A stop-arm 108 is also mounted on the shift-rail 34 for limiting the movement of the lever 101. As shown in Figure 9, a pin 109 projects from the upper end of the lever 101 and normally engages, in the operative position, a vertical slot 110 formed in a shift or coupler slide 111, which has a rear depending wall 112 engaging a vertical plate 113 fixed on the universal bar 54 by screws or other suitable means, and having a horizontal slot 114 therein (see Figure 1). A bolt 115 passes through said slot from the rear and is secured in the wall 112, thereby slidably mounting the slide 111. It should be noted that the universal bar 54 is operated by the heels 53 of the type-bars 37 during the later part of each type-train actuation and that the ribbon-vibrator 88 will be moved to present the nearest ribbon-field in front of the printing point if the coupler 111 is in a leftward position.

As clearly shown in Figure 1, a bent link 117 connects the shift slide 111 and a horizontal lever 118, which is mounted on a vertical pivot-screw 119 on the frame 20 of the typewriter. The forward end of the lever 118 is turned upwardly and rearwardly into a rearward extension 120, which is provided with a lengthwise slot 121 (see Figure 5), permitting the lever 87 to be pushed from the full-line position to the dotted-line position. The lever 87 has a universal detachable mounting 122 in the lower horizontal extension of a spring 123, which is secured on an upright extension of the lever 118.

Referring to Figure 1, there are three notches 124, which yieldably secure the lever 87 in any of the index positions, it being shown at red position 85 in this figure, and a recess 125 in back of the notches permits the rearward and sidewise movement of the lever 87.

The ribbon-vibrating mechanism, which has just been described and which is operated by the escapement universal bar 54, controls the shifting of the ribbon when the upper half or black band 82 is used. A separate and distinctive mechanism for shifting the lower half of the ribbon or of the red band 83 will now be described. A roller-pin 126 is mounted horizontally on the left side of the vibrating lever 101. A forwardly-inclined ver-

tical wall 127 forms a part of a control-piece 128, which is provided with a horizontal slot 129 riding on a horizontally-projecting screw 130 mounted on a bracket 131, as clearly shown in Figure 5, which may be secured at the rear on the cross-piece 75 of the typewriter-frame by a screw 133. A forwardly and upwardly extending arm 132 connects the control-piece 128 by means of a pin 134 with a lever 135, which is fulcrumed on a horizontal rod 136 secured in the lower part of the frame of the machine by set-screw collars 137. A depending coupler-link 138 is horizontally pivoted on a lower forwardly-extending end of the lever-arm 135 at 139, so that the link 138 is permitted to oscillate forwardly and rearwardly on its pivot 139. Arm 140 is pivotally connected to the link 138 by a pin 146, and at the rear is fastened by a pin 141 to a vertical upright end 142 of a lever 143, which is horizontally pivoted for forward and rearward swinging motion on a screw 144, which is fixed on a depending bracket 145, which is in turn suitably secured by screws, or in any other desired manner, to a rear cross-piece of the frame 20.

A rearwardly apertured hook 147 is formed at the bottom of the depending coupler-link 138 which may engage a horizontal pin 148 mounted on a depending bracket 149, the bracket being fast on a cross-bar or universal bar 150. The universal bar 150 has two forwardly-extending arms 151 terminating in square sockets which are mounted on a square cross-bar 152, which in turn is secured at either end with adjustable pivot-screws 153, as shown in Figure 2, which are mounted on arms 154, these arms 154 being rotatably mounted on stub-shafts 155, 156, respectively, both shafts being secured in the sides of the frame 20 by countersunk screws 157.

Pins 158 on the inner ends of the stub-shafts 155, 156 provide a bearing for a rock-shaft 159, the left end of which carries a hollow slidable cap 160 adjustable on the left end of the shaft to increase or decrease the length of the shaft, and secured thereto in a fixed position by a set-screw 161. Arms 162 fixed on the shaft 159 extend to the front of the typewriter and support a usual spacer-bar 163, which, when depressed, rocks shaft 155 forwardly, and so, in turn, actuates a letter-spacer finger 164 centered on shaft 159. A screw-and-slot adjustment 165 is provided in the lever 135.

It is clear from the description above given of the cross-bar construction that I provide a shorter shaft 159, which, by reason of its shortness, remains stiffer and more rigid, and thereby prevents any variation in the precision of the operation of the mechanism. Moreover, on the left end of the shaft the adjustable cap permits an easy assembly of the shaft in the machine, and also enables a precise adjustment of the shaft with reference to its mounting.

The universal bar 150 is supported by a spring 169 tied to the arm 151 and suspended from the frame 20, and therefore the tongues 168 are resiliently held in their uppermost position. The universal-bar 150 is therefore operated by the key-levers 47 during substantially the full operating movements of the various type-operating trains.

Referring to Figure 5 and other figures of the drawings, a lug 166 depends from each key-lever 47. Inasmuch as the key-levers are set in four rows or banks 167, it is obvious that the downward movement of one row varies from that of another row, so that equal and uniform motion of the universal bar 150 is attained only by compensating for the difference in the angular downward stroke of the key-levers 47 in rows representing the higher banks of keys. This compensating effect is had by arranging the lugs 166 on the key-levers, at various distances from the pivots 49 thereof, in accordance with the different lengths of the key-levers. The universal bar 150 presents a susbtantially flat surface for engagement by the various lugs 166 which, being at different locations on the levers and therefore at various distances from the universal-bar pivot, actuate the universal bar a substantially uniform angular distance, notwithstanding the different key-lever lengths and strokes.

I provide a flexible tongue 168 extending rearwardly and upwardly from the universal bar beneath each key-lever, the tongues being of four lengths corresponding to the four rows of key-levers, the higher tongues engaging lugs 166, which depend from levers connected with the upper row of keys 48^a, the next shorter row of tongues connecting with the levers which carry the row of keys 48^b, the third row of tongues corresponding with the levers carrying the row of keys 48^c, and the last or shortest row contacting lugs which correspond with the lowest row of keys 48^d.

At the front of the machine a transverse cushion stop 173 of felt, rubber, or elastic material, or the like, cushions the upper edge of the key-lever 47.

It is now clear that the four rows of tongues 168, mounted on the universal bar 150, which underlie respectively the four rows of lugs 166 of key-levers 47, provide for equal and uniform downward movement of the universal bar 150, thereby causing, when the depending link 138 is in engaged position with the pin 148 on the bracket 149, the ribbon-guide 89 to vibrate a uniform predetermined distance to present the lower or red band 83 of the ribbon 81 between a type 41 and the platen 25 in the lower-case position (see Figure 9), or between a type 40 and the platen 25 in the upper-case position, according to the setting of the platen-shaft (see Figure 11), for which condition the control-lever 87 is at the extreme left notch 124 by the red index 85, as shown in Figure 1. If the lever 87 is moved to the right to the white or the neutral index 84, the ribbon-vibrator is disconnected from both universal bars and the typewriter is prepared for stenciling, and when the lever 87 is moved to the right notch 124 adjacent the black index 86 the shift slide 111 moves into engagement with the pin 109 mounted on the lever 101, so that the universal bar 54 is operatively connected to actuate the ribbon-guide 89 to interpose the black band 82 of the ribbon between either type 41 or type 40 and the printing line 100 on the platen 25.

Figure 9 shows the lower-case type 41 in engagement with the black band 82 against the printing line on the platen 25. The pin 109 is engaging the slot 110. Figure 10 shows the lower-case type 41 in engagement with the red band 83 against the printing line on the platen 25. The roller-pin 126 is in engagement with the upright wall 127 of the lever 128. Figure 11 shows the upper-case type 40 in engagement with the red band 83 of the ribbon 81 on the printing line of the platen 25. The roller-pin 126 is in engagement with the top of the upright wall 127 of the lever 128. Figure 12 is the stenciling position with the ribbon unoperated below but very close to the printing line.

As shown in Figure 6 diagrammatically when an upper-case type 40, in this case the capital letter "I", intercepts the red band 83 of the ribbon 81 it intercepts the red band symmetrically with reference to a central line *a—b*, but in the case of type-bars having certain type thereon, especially those which in the lower-case form have depending tails, such as g, j, p, q, y and z, a different condition exists. As shown in Figure 7, the capital letter "G" would be in the same position normally with reference to the red band 83 as the capital letter "I", as shown in Figure 6. But in the lower-case position, shown in outline in Figure 7, the small letter "g" would not be centered symmetrically because of its depending tail, so that the lower end of the tail, if the lower-case type 41 is a character having a tail, would be very near the lower edge of the red band, if the ribbon were to remain in the normal position, as shown in Figure 6. By bending down or flexing the tongues 168, as shown in Figure 7, beneath the type-characters 41, having depending tails, it is obvious that while the lug 166 on a key-lever 47 is traveling downwardly a part of its movement is merely lost-motion, and therefore the universal bar 150 is pushed down under these keys only a part of a normal movement for the red-band position, and consequently, therefore, the ribbon-vibrator operates only a part of the full normal lifting stroke, so that at the printing line the ribbon has been raised only to the position shown in Figure 7, or is lower than the line *a—b* in Figure 6 by a space equal to the difference in the elevation of this line and the line *c—d* in Figure 7. This shorter vibration of the ribbon leaves a wider margin beneath the tail of lower-case characters 41 having depending tails, thereby eliminating the liability of failure to clearly and fully imprint the characters in red on a work-sheet, because of crinkling or folding at the lower edge of the ribbon when vibrated.

A pin-and-slot connection 174 (see Figure 1) at the right end of the lever 143 ties up to the right-angled bottom bend of a vertical lever-arm 175, which is mounted on a horizontal stub-shaft 176 carried at the upper end of a vertical bracket 177 fixed on the machine-frame 20. The lever-arm 175 is pivotally connected at its upper end to the inner end of a link 178, the link being connected by a loose pin-mounting 179 with the depending ear of a leftwardly-extending arm 180 integral with the lever 118. It is now obvious that when the lever 87 is moved to the left in the notch 124 proximate the index 85, the hook 147 is pushed into engagement with the pin 148, so that the key-levers 47 actuate the ribbon-vibrator 88 to interpose the red band 83 of the ribbon at the printing position.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. A typewriter, having in combination, types, multiple mechanisms individually operable to selectively move the said types to the printing point, a ribbon-vibrator for normally holding a multiple-color-field ribbon removed from the printing point, and means to vibrate the said ribbon-vibrator at each operation of any of said mechanisms to move the desired ribbon-field in front of the printing point, including, a universal member operable by the said mechanisms to move the said ribbon-vibrator to one ribbon-field position, a universal member operable by said mechanisms to move the said ribbon-vibrator to another ribbon-field position, and means to predetermine which of the universal members is to be effective to move the said ribbon-vibrator at each operation of any of the said multiple mechanisms.

2. A typewriter, having in combination, types, type-operating trains individually operable to selectively move the said types to the printing point including each a lever; a ribbon-vibrator for normally holding a two-color-field ribbon removed from the printing point, and means to vibrate the said ribbon-vibrator at each operation of any of said trains to move the desired ribbon-field in front of the printing point, including, a universal member operable by the said trains to move the said ribbon vibrator to present one ribbon-field in front of the printing point, another universal bar operable by the said levers to move the ribbon vibrator to present the other ribbon-field in front of the printing point, and means to operatively connect the said ribbon-vibrator to either one of said universal members for operation thereby to the desired ribbon-field position at each operation of any of the said trains.

3. A typewriter, having in combination, type-bars, individual type-bar operating trains, a ribbon-vibrator for normally supporting a two-color-field ribbon removed from the printing point, and means to vibrate the said ribbon-vibrator at each operation of any type-bar to move the desired ribbon-field in front of the printing point, including, a universal-bar operable by the said type-bars for moving the ribbon-vibrator to one field-position, a universal-bar operable by the said type-bar operating trains for moving the said vibrator to the other ribbon-field position, and means to predetermine which of the universal bars is to be effective to move the said ribbon-vibrator at each operation of any of the said trains.

4. A typewriter, having in combination, types, multiple trains individually operable to selectively move the said types to the printing point, a ribbon-vibrator for normally holding a two-color-field ribbon removed from the printing point, and means to vibrate the ribbon-vibrator at each operation of any of said trains to move the desired ribbon-field in front of the printing point, including, a universal member operable by the said trains to move said ribbon-vibrator to one field-position, another universal member operable by the said trains to move the said ribbon-vibrator to the other ribbon-field position, and settable means to operatively connect one or the other universal members to the said vibrator or to operatively disconnect both said universal members therefrom.

5. A typewriter, having in combination, type-bars, type-bar operating key-levers, a ribbon-vibrator for normally supporting a two-color-field ribbon removed from the printing point, and means to vibrate the said ribbon-vibrator at each operation of any key-lever to move the desired ribbon-field in front of the printing point, including, a universal member operable by the said type-bars for moving the ribbon-vibrator to one ribbon-field position, a universal-member mounted adjacent to the said key-levers and operable thereby for moving the said ribbon-vibrator to the other field-position, and means to predetermine which of the universal-members is to be effective to move the said ribbon-vibrator at each operation of any key-lever.

6. In a typewriter, having in combination, types, multiple trains individually operable to selectively move the said types to the printing point, a ribbon-vibrator for normally holding a multiple-color-field ribbon below the printing point, and means to vibrate the said ribbon-vibrator at each operation of any of said trains to move the desired ribbon-field in front of the printing point, including, a universal-bar operable by said trains to vibrate the said vibrator to one ribbon-field position, a universal bar operable by the said trains during the later part of each type-bar operating movement to vibrate the said vibrator to the other ribbon-field position, and means to predetermine which of the universal bars is to be effective to operate the said ribbon-vibrator at each train-operation of any of the said multiple trains.

7. In a typewriter, having in combination, types, multiple trains individually operable to selectively move the said types to the printing point, a ribbon-vibrator for normally holding a multiple-color-field ribbon below the printing point, and means to vibrate the said ribbon-vibrator at each operation of any of the said trains to move the desired ribbon-field in front of the printing point, including, a universal bar operable substantially by the full movements of the said trains to vibrate the said vibrator to one ribbon-field position, a universal bar operable by the said trains during the later part of their actuations to vibrate the said vibrator to the other ribbon-field position, and means to predetermine which of the universal bars is to be effective to operate the said vibrator at each operation of any of the said multiple trains.

8. In a typewriter, having in combination, a carriage, a carriage-feed device, type-bars, individual type-bar actuating trains, a universal bar operated during the last part actuation of said trains by the said bars, said universal bar being connected to operate the said feed-device, a ribbon-vibrator for normally holding a two-color-field ribbon removed from the printing point, means operable by the said universal bar to move the said ribbon-vibrator to present the nearest ribbon-field in front of the printing point, another universal bar operable by the said trains substantially throughout their full actuations to move the said ribbon-vibrator to present the other ribbon-field in front of the printing point, and settable means to operatively connect either of said universal bars to the said vibrator.

9. In a typewriter having a carriage, in combination, types, multiple trains individually operable to selectively move the said types to the printing point, a carriage-feed device, including a universal bar operable by the said trains; a ribbon-vibrator for normally holding a multiple-color-field ribbon removed from the printing point, means operable by the said carriage-feed universal bar to move the said ribbon-vibrator to present one color-field in front of the printing point, another universal bar operable by the said trains to move the said ribbon-vibrator to present the other color-field in front of the printing point, and settable means to operatively connect said vibrator to either said universal bars.

10. In a typewriter having a carriage, types, multiple trains individually operable to selectively move the said types to the printing point, in combination, a carriage-feed device, including a universal bar operable by the said trains; a ribbon-vibrator for normally holding a multiple-color-field ribbon removed from the printing point, a pivoted lever connected to the said vibrator, means, including a coupler, whereby the said vibrator may be moved at each operation of any of the said trains by the said carriage-feed universal bar to move one color-field in front of the printing point, another universal bar operable by the said trains, means, including another coupler, whereby the said vibrator may be moved by the said other universal bar to move another color-field in front of the printing point, and means to set said couplers to effect operation of said lever by one or the other of said universal bars when said trains are being operated.

11. A typewriter, having in combination, type-bars, individual type-bar operating trains, a ribbon-vibrator for normally supporting a two-color-field ribbon removed from the printing point, and means to vibrate the said ribbon-vibrator at each operation of any type-bar to move the desired ribbon-field in front of the printing point, including, a universal-bar operable by the said type-bars for moving the ribbon-vibrator to one field-position, a universal-bar operable by the said type-bar operating trains for moving the said vibrator to the other ribbon-field position, and means, including a single hand-control, to predetermine which of the universal bars is to be effective to move the said ribbon-vibrator at each operation of any of the said trains.

12. A typewriter, having in combination, type-bars, type-bar operating key-levers, a ribbon-vibrator for normally supporting a two-color-field ribbon removed from the printing point, and means to vibrate the said ribbon-vibrator at each type-bar operation to move the desired ribbon-field in front of the printing point, including, a universal-bar operable by the said type-bars for moving the ribbon-vibrator to one field-position, a universal-bar operable by said levers for moving the said vibrator to the other field position, arranged underneath the said key-levers and having an adjustable part associated with each key-lever, and means to predetermine which of the universal-bars is to be effective to move the said ribbon-vibrator at the operation of any type-bar.

13. A typewriter, having in combination, types, type-operating trains, including, levers having different angular travel to move the said types selectively to the printing point; a ribbon-vibrator for normally holding a two-color-field ribbon removed from the printing point, and means to vibrate the said vibrator at each operation of any of said trains to move the desired ribbon-field in front of the printing point, including, a universal bar operable by the said trains for moving the said vibrator to one ribbon-field position, another universal bar operable by the said levers for moving the said vibrator to the other ribbon-field position, and means to predetermine which of the universal bars is to be effective to move the said vibrator at each operation of any of the said trains, said other universal bar being operable by said levers through lugs provided at proportionate distances from the lever-pivots to compensate for the said different angular travels of the levers.

14. A typewriter, having in combination, types, individual type-operating trains including levers having different angular travel individually operable to selectively move the said types to the printing point, a ribbon-vibrator for normally holding a two-color-field ribbon removed from the printing point, and means to vibrate the said vibrator at each train-operation to move the de-

sired ribbon-field in front of the printing point, including, a universal bar operable at each operation of any of the said trains to move the said ribbon-vibrator to one ribbon-field position, another universal bar operable by the said levers to move the said ribbon-vibrator to the other ribbon-field position, and means to predetermine which of the universal bars is to be effective to move the said vibrator at each operation of any of the said trains, said other universal bar having individual tongues cooperating with the said levers at proportionate distances from the lever-pivots for receiving substantially uniform motion from all the said levers, irrespective of their differing angular type-operating travels, said tongues being bendable for individually adjusting the motion that can be imparted to the said other universal bar by the operation of the individual levers.

WILLIAM F. HELMOND.