June 28, 1932. O. A. HOKANSON ET AL 1,864,594

TYPEWRITER

Filed Jan. 4, 1929 3 Sheets-Sheet 1

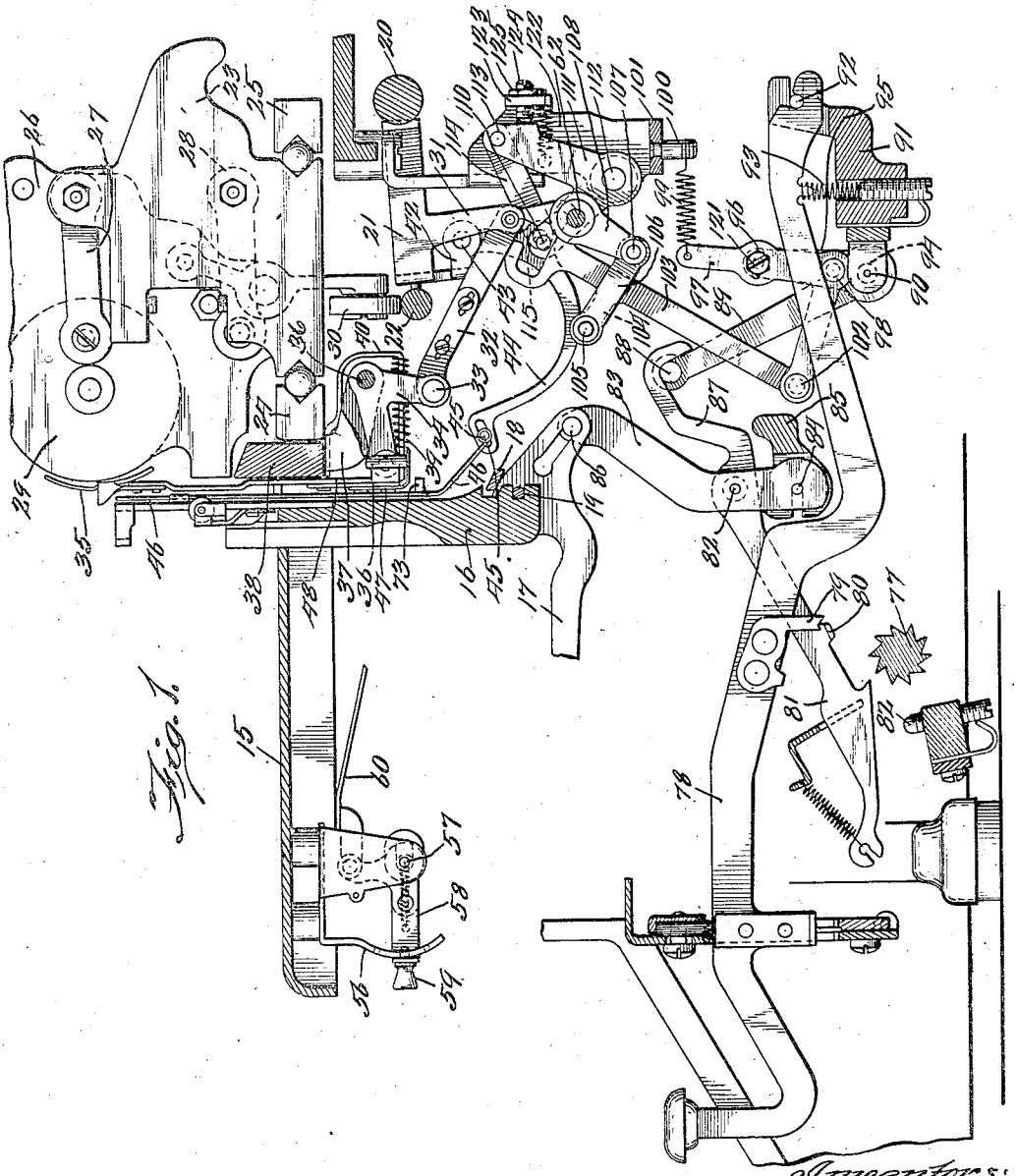


Fig. 1.

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TYPEWRITER

Filed Jan. 4, 1929 3 Sheets-Sheet 2

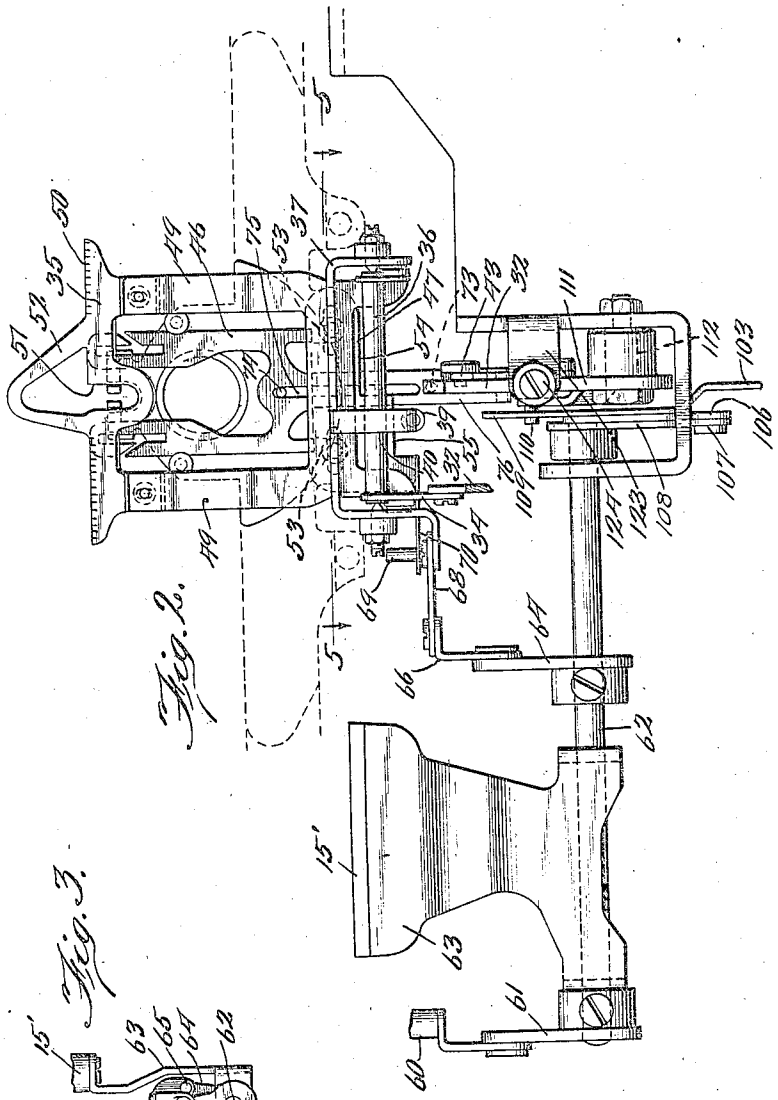


Fig. 2.

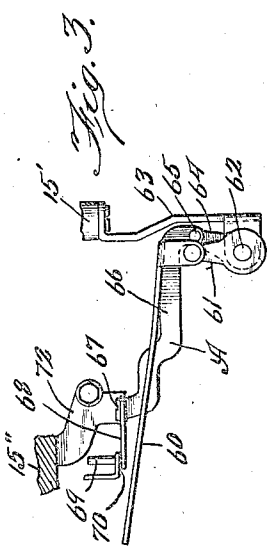


Fig. 3.

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TYPEWRITER

Filed Jan. 4, 1929 3 Sheets-Sheet 3

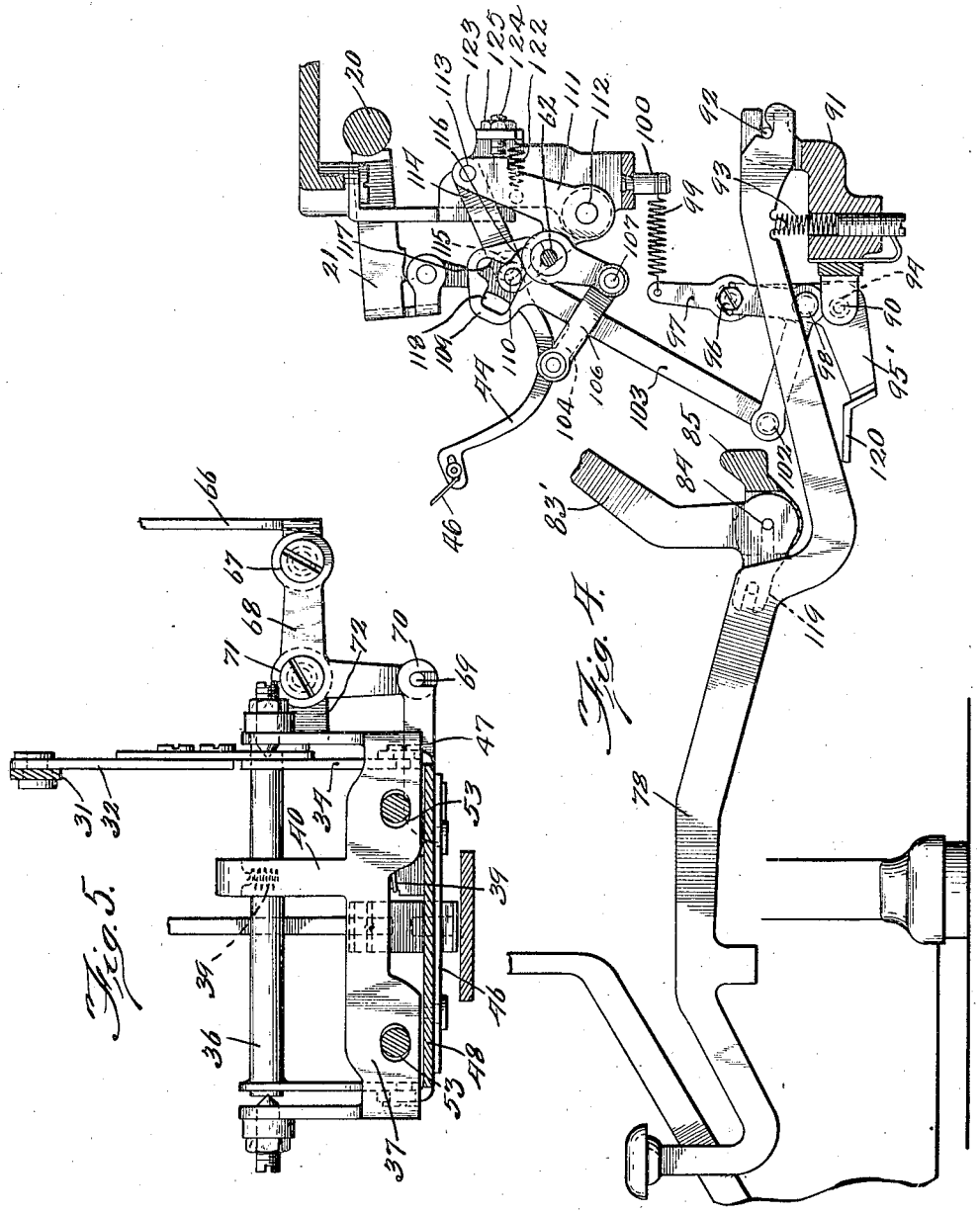


Fig. 4.



Fig. 5.

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Patented June 28, 1932 1,864,594

# UNITED STATES PATENT OFFICE

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## TYPEWRITER

Application filed January 4, 1929. Serial No. 330,201.

This invention relates to typewriter mechanism in which the impression ribbon is moved to a position over the printing point at the platen at each stroke of a type bar, and one of the objects of the invention is the provision of new and improved means by which the throw of the ribbon may be varied and brought to rest in the desired positions with accuracy and without overthrow.

Another object of the invention is the provision of means for varying the setting of the ribbon vibrator mechanism for its varied operation and operating the ribbon vibrator according to its set position with accuracy.

Another object of the invention is the adaptation of ribbon vibrator mechanism to an electrically operated typewriter and maintaining accuracy of the stopping of the ribbon in the desired positions.

Another object of the invention is the provision of mechanism for effecting the starting of the ribbon movement simultaneously with the movement of the type bar, particularly when the printing is to be done through the red zone of the ribbon.

More particularly it is the object of the present invention to provide improved and efficient mechanism for throwing the ribbon to different color positions without overthrow so that when one color of ribbon, such as black, is to be used, none of the other color, such as red, will appear on the typewriting produced.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claims.

In the accompanying drawings—

Fig. 1 is a sectional elevation of a typewriter embodying our invention and adapted to electrically operated type bar mechanism;

Fig. 2 is a rear elevation of the line finder and ribbon carrier, together with the stop mechanism for limiting the throw of the ribbon vibrator;

Fig. 3 is a fragmentary view showing a side elevation of a portion of the structure shown in Fig. 2;

Fig. 4 is a sectional elevation of a portion of a typewriter illustrating our invention applied to manually operated type bar mechanism; and

Fig. 5 is a sectional plan view taken on the line 5—5 of Fig. 2, but looking downwardly from the front of the machine instead of from the rear thereof as in Fig. 2.

In typewriters having a front keyboard it is customary to provide ribbon vibrator mechanism actuated by the type bars for moving the ribbon over the printing point to receive the impression of the type at the time the type strikes the platen, the ribbon being withdrawn downward after each impression to permit easy visibility of the matter typewritten. It is common to employ a two color ribbon, such as black and red, and to provide means for shifting either horizontal zone of the ribbon of one color or the other over the printing point of the platen so that the writing may be in either one of the two colors, as desired. It is also desirable to prevent the ribbon from being moved upwardly at all when a type bar is operated so that the ribbon will not be moved to the printing point and so that stencils may be cut by the type. The present invention provides for the accomplishment of all of these results in connection with manually operated typewriters, as well as in connection with electrically operated typewriters, with the assurance that there will not be any overlapping of the colors in the horizontal zones of the ribbon whether the writing is in the upper case or the lower case.

Referring to Fig. 1 of the drawings, 15 designates the top plate of a "Woodstock" typewriter, although the invention may have a general application. A type bar segment 16 having type bars 17 pivoted thereto is supported on the frame 15. An arcuate universal bar 18 lies in the path of the type bars 17 and is operated thereby in the manner similar to that shown in Patent No. 1,276,118, granted August 20, 1918. Upon the operation of any type bar 17 on the pivot 19 the universal bar 18 is thrust rearwardly to operate the escapement mechanism in a well-known manner.

At the upper back portion of the frame of the typewriter is mounted a rock shaft

20. This rock shaft 20 carries a forwardly extending arm 21 and in front of the arm 21 so as to move up and down with the latter when the shaft 20 is rocked, is a platen carriage shift rail 22 extending across the machine frame.

A carriage frame 23 is mounted between the rails 24 and 25 which are fixed to the frame of the machine. A platen carriage 26 is mounted on links 27, 28 which permit the vertical movement of the platen 29 for case shift. A roller 30 runs on the rail 22 by means of which the platen is lifted when the rock shaft 20 is oscillated by the shift key. The shift key, not shown, has connection with an arm secured to the supports for the rail 22 so that when the shift key is depressed the rail 22 is elevated, thus lifting the platen to its upper position.

Depending from the arm 21 is a bracket 31 to the lower end of which is pivoted a link 32 extending upwardly and at an angle and pivoted at 33 to the bell crank 34 which is connected to the line finder 35. The bell crank 34 is pivoted at 36 to the bracket arm 37 that is secured rigidly to the typewriter frame. The line finder is suitably guided to move vertically in front of the machine frame member 38 and back to the segment 16. The line finder tension spring 39 is connected between the lower end of the line finder and the bracket 40 which is fixed to the frame 38. This spring 39 is for the purpose of holding the upper edge of the line finder in yielding engagement with the platen.

Also depending from the arm 21, as shown in Fig. 1, is another bracket arm 42 to which is pivoted at 43 the ribbon vibrator 44 which has a pin and slot connection at 45 to the lower end of the ribbon holder 46 which is guided in a frame fixed to the segment 16 in a plane in front of the plane of the line finder.

The weight of the platen and the parts associated therewith act on the roller 30 and thence on the rail 22 to hold the arm 21 in its lower position and therefore also the line finder and the ribbon vibrator, as shown in full line in Fig. 1. When the shift key is depressed and the guide rail 22 elevated by rocking the shaft 20 the ribbon vibrator 44 and the ribbon holder 46 will be elevated because of the forward movement of the bracket arm 42. It should be understood, however, that the ribbon vibrator bail 44 is pivoted at 43 to the bracket arm 42 and not fixed thereto for reasons which will be hereinafter explained. Also, when the shift key is depressed and the guide rail 22 elevated the arm 31 will be moved forward or toward the keyboard of the typwriter which will result in movement of the adjustable link 32 forward and the movement of the bell crank 34 on the pivot 36 so as to elevate the line finder in accordance with the shifting of the platen to its upper position. While the line finder always ocupies a fixed relative position with the platen according to its adjustment, the ribbon vibrator operates independently of the line finder and is shiftable to various positions according to whether one color or another of the ribbon is desired for the typewriting to be accomplished, or whether the typewriter ribbon is to be held out of the path of the type so that stenciling may be done.

In order that the upper movement of the ribbon may always be arrested or stopped at the same definite position relative to the printing line, the stop plate 47 (Fig. 2) is mounted on the support for the line finder so as to move up and down with the latter. This support comprises a plate 48 having arms 49 extending upwardly therefrom. The line finder 35 has an upper horizontal edge 50 for indicating the line position and is provided with an opening 51 for receiving the type bars. An inverted U-shaped portion 52 bridges the upper part of the opening 51 to assist in holding the paper in position at the printing point.

The stop plate 47 is mounted to slide in a direction parallel to the line finder edge 50 and is permitted to have such sliding movement by reason of the pin and slot connections at 53, 53. The stop plate 47 is provided with two horizontal stop edges 54 and 55 at different elevations, as shown in Fig. 2, so as to arrest the ribbon either for black or for red.

Mounted on the under side of the front of the top plate 15, as shown in Fig. 1, is a ribbon shift lever bracket 56 to which is pivoted at 57 a bell crank 58 having at its outer end the ribbon shift lever knob 59. By moving the knob 59 over the arcuate surface of the bracket 56 the ribbon shift lever may be set to indicate either red, black, or stenciling.

Movement of the ribbon shift lever 58 moves the ribbon shift link 60 which is connected to the bracket arm 61 on the rock shaft 62, as shown in Fig. 3. The rock shaft 62 is mounted in a bracket 63 which is rigidly secured to the rear frame 15′ of the typewriter.

Also rigidly secured to the rock shaft 62 so as to move therewith is a bracket arm 64, as shown in Fig. 3, to the upper end of which is pivoted at 65 a link 66. The other end of the link 66 is pivoted at 67 to the bell crank 68, the other arm of which has an upstanding pin 69 which is engaged by the slotted extension 70 which is secured to the stop plate 47. Fig. 3 shows in elevation the connections for operating the stop plate 47, whereas Fig. 5 shows the connection in plan. The bell crank 68 is pivoted at 71 to the supporting frame 72 which is rigidly connected to the frame 15″ of the typewriting machine.

It should be understood that when the knob

59 is moved up or down the line finder and ribbon vibrator remain at their adjusted elevations. Movement of the lever 58 will adjust the position of the stop plate 47 so as to bring either the stop edge 54 or the stop edge 55 above the stop pin 73 which is mounted on the ribbon vibrator, as shown in Fig. 2. Downward movement of the ribbon vibrator is limited by the lever 111 striking against the adjustable abutment screw 124, as shown in Fig. 1, because as hereinafter more fully described, the bail 44 is connected by the link 114 to the lever 111 which is pivoted at 112 to the bracket 122 rigidly connected to the frame of the machine. The initial position of the ribbon vibrator may therefore be accurately adjusted by means of the abutment screw 124. It should be understood that the pin 74 which is fixed to the segment 16 projects into the slot 75 of the downward extension 76 of the ribbon holder 46 for the purpose of acting as a vertical guide for the ribbon holder 46. As shown in Fig. 1, the lower end of the ribbon vibrator has a pin and slot connection at 45 with the bail 44 and the other end of the latter is pivoted at 43 to the arm 21 which moves up and down during case shifting.

When the platen is moved up and down the arm 31 moves the link 32 and the bell crank 34 will rock the shaft 36 which is pivoted on cone bearings in the frame 37, as shown in Fig. 2. There is therefore a positive movement of both the line finder and the ribbon vibrator up and down in accordance with the up and down case shifting. The stop plate 47 being mounted on the line finder 29 by reason of the pin and slot connections at 53, 53 moves up and down with the line finder, but the stop plate extension 70 remains connected to the upstanding pin 69 on the bell crank 68, the height of the pin 69 being sufficient to always retain connection between the bell crank 68 and the stop plate 47 for the various heights of the latter.

It should be particularly understood that it is desirable to maintain a proper relation of the ribbon with the platen both when the platen is in its lower position and when it is in its upper position. It is for this reason that the stop plate 47 moves up and down with the line finder so that the stop plate, as well as the line finder, may always be in the same relative position to the platen. The ribbon vibrator will then be stopped in its upward movement in its desired position relative to the platen whether the case shifting movement has been effected or not.

Referring to Fig. 1 showing a power ratchet roller 77 of an electric typewriter, it will be seen that when the key lever 78 is depressed so as to cause the connecting device 79 to engage the projection 80, the operating lever 81 will be brought into engagement with the power roller 77 and then be disengaged therefrom by striking the abutment 82. While the operating lever 81 is in engagement with the power roller 77 a forward pull will be exerted on the pivoted connection at 82 with the sub-lever 83, the lower end of which is connected at 84 to the machine frame 85 and the upper end of which has a pin and slot connection at 86 with the type bar 17 which is pivoted at 19 to the segment 16.

Extending rearwardly from each operating lever 81 of the typewriter is a hooked extension 87 which engages a rod 88 extending across the whole machine and being mounted at its ends on bracket arms 89 which are pivoted at 90 to the machine frame 91. The key lever 78 is pivoted at 92 on the rear lower portion of the typewriter frame and is provided with a restoring spring 93, as shown in Fig. 1.

The arms 89 are connected to a rock shaft 94, the ends of which are pivoted as illustrated at 90 in Fig. 1 to the machine frame 91. At the central portion of the rock shaft 94 is an upstanding bracket arm 95, the upper end of which has a screw and slot connection at 96 with the bell crank lever 97. This bell crank lever 97 is pivoted at 98 to the lower portion of the arm 95. A spring 99 is connected between the upper end of the lever 97 and the pin 100 attached to the frame 101 of a typewriting machine. The screw and slot connection 96 is for the purpose of adjusting the position of the bell crank 97 on the pivot 98 relative to the arm 95, but when in adjusted position the bell crank 97 is rigidly connected to the arm 95 and moves therewith and this arm 95 is in turn rigidly connected to the rock shaft 94 so as to move in unison with the arm 89. It will thus be seen that when the actuating lever 81 is thrust forward by the power roller 77 the hook lever 87 by engaging the bar 88 moves the arm 89 forward on the pivot 90 and together with this arm against the action of the spring 99 moves not only the arm 95 but also the bell crank lever 97. The lower forwardly extending arm of the bell crank 97 is pivoted at 102 to the lower end of the link 103.

Intermediate the ends of the link 103 is a forwardly extending arm 104 to which is pivoted at 105 the link 106, the rear end of which is pivoted at 107 to the lower end of the crank arm 108, the latter being rigidly connected to the rock shaft 62. By referring to Fig. 3, it will be seen that the rock shaft 62 also carries the cranks 61 and 64. Consequently when the shift lever 58 is moved up or down the link 60 will rock the shaft 62 and therefore not only position the stop plate 47, but also swing the link 103 forwardly or rearwardly on the pivot 102 to position the upper end portion 109 which is provided with a slot of a special configuration or contour to cooperate with the pin 110 which extends laterally from one arm of the bell crank 111 which

is pivoted at 112 to the machine frame 101. The rear arm of the bell crank 111 is pivoted at 113 to the link 114, the forward end of which has a pivotal connection at 115 to the ribbon vibrator bail 44.

The slotted head 109 at the upper end of the link 103 has in reality three slots 116, 117 and 118. The ribbon stop shift lever 58 may occupy three different positions corresponding to the slots 116, 117 and 118 and the movement of the knob 59 to the three different positions will set the slots 116, 117 and 118 correspondingly. For instance, the knob 59 may be set for typewriting on the red zone of the ribbon and the shaft 62 rocked to move the lever 103 forwardly to its forward limit, thus placing the slot 116 over the pin 110. By placing the knob 59 in its mid-position the shaft 62 may be rocked so as to move the slot 117 to the position shown in full lines in Figs. 1 and 4 for the stenciling position of the ribbon. By moving the knob 59 to its position for typewriting on the black zone of the ribbon the slot 118 may be moved to its rear position over the pin 110 so as to permit a limited movement of the latter. In other words, simultaneously with the shifting of the stop plate 47 by operating the knob 59, the lever 103 may be moved arcuately on its pivot 102 so as to vary the position of the slots 116, 117 and 118 relative to the pin 110.

It can readily be seen that when the typewriter key 78 is operated to effect forward movement of the arm 89 and downward movement of the link 103 if the slot 117 is over the pin 110, as shown in full lines in Fig. 1, the downward movement of the lever 103 will not be sufficient to engage the pin 110 and therefore no movement of the bell crank 111 will take place on the rock shaft 107 and consequently the link 114 will not be moved forward and the ribbon vibrator 46 will not be moved upwardly, but will remain in its lower position so that stenciling may be done. This is true also for case shifting because of the bracket arm connections 42 and 31 with the arm 21, as shown in Fig. 1. That is, although the ribbon vibrator moves up and down during case shifting, there will be no movement of the ribbon vibrator relatively to the platen after the latter has been shifted. Therefore the small letters will be stenciled when the platen is in its lower position and capital letters will be stenciled when the platen is in its other position, because in neither position can the ribbon vibrator be operated because the slot 117 is so long as to prevent downward movement of the link 103 from engaging the pin 110.

If the red zone on the ribbon is on the lower half of the ribbon it will be desired to move the ribbon upwardly to a maximum extent and the knob 59 should therefore be moved so that the slot 116 will be moved over the pin 110. This is done by rotating the shaft 62 in a clockwise direction, as illustrated in Fig. 1, or by moving the knob 59 to its upper limit. Then when the typewriter is operated and the link 103 pulled down the pin 110 will be immediately engaged to move the crank 111 to its maximum extent and thus cause the ribbon vibrator to be moved to its uppermost limit, bringing the lower zone of the ribbon into the path of the type as they strike the platen. This is true for both upper and lower case, because when the arm 21 is moved up or down the ribbon vibrator is maintained in the same relative position to the platen and therefore the movement of ribbon vibrator effected by the downward movement of the link 103 is an added movement of the ribbon to its position either in lower case or upper case.

It will also be seen that when the knob 59 is moved up to rock the shaft 62 in a clockwise direction to bring the slot 116 over the pin 110 the link 66 will be pulled to the right, as viewed in Fig. 3, and as shown in Fig. 5, this results in a pulling out of the stop extension 70, that is, the stop plate 47 will be pulled to the left, as viewed in Fig. 2, thereby bringing the stop edge 47 into the path of the pin 73 which is shown in Figs. 1 and 2. The stop pin 73 is connected to the ribbon vibrator to move up and down therewith. In electric typewriters where the operation is very quick when the type bars are actuated, it is particularly desirable to have the stop edges 54 and 55 prevent overthrow of the ribbon. The ribbon should stop as to properly print the whole type each time it is struck and the red should not overlap the black.

It should be particularly noted that both in the manual operation and in the electrical operation, the upper edge of the slot 116 will engage the pin 110 so as to start the upward movement of the ribbon holder just as soon as the type bar is begun to be operated so as to assure movement of the lower or red zone of the ribbon to such position that the type will print through such lower or red zone when the type strikes the platen, thereby avoiding the printing of part black and part red.

When it is desired to print through the black zone of the typewriter ribbon the knob 59 may be moved to its lowermost limit to rock the shaft 62 in an anti-clockwise direction, thus pulling the upper end of the link 103 toward the right to bring the slot 118 over the pin 110. Then when the type bar is operated the link 103 will have a certain downward lost motion before the upper edge of the slot 118 engages the pin 110 to move the crank 111 on its pivot 112 and thereby effect forward movement of the link 114 and the swinging upwardly of the ribbon vibrator bail 44 on its pivot 43. The ribbon vibrator will therefore be moved upwardly partially

so as to bring the upper black zone of the ribbon into proper position relative to the platen. This is true both as to the upper case and lower case, because whatever the position of the platen and the ribbon vibrator, the movement of the ribbon vibrator by operation of the type bar is an added movement.

At the same time that the knob 59 is moved to its lowermost limit to move the slot 118 over the pin 110, the rock shaft 62 as shown in Fig. 3 will be moved in an anti-clockwise direction and therefore the link 66 will be pushed toward the left which, as shown in Fig. 5, will effect a pushing-in of the extension 70 so as to move the stop edge 55 toward the right, as viewed in Fig. 2. The stop edge 55 will therefore be brought over the top of the pin 73 so as to limit the upward throw of the ribbon vibrator. It should be particularly understood that the stop edges 54 and 55 are arranged to be so located as not to prevent the full movement of the ribbon that is desired by the setting or positioning of the slots 116 and 118, but these stop edges are in position to prevent any excess movement beyond the desired throw of the ribbon so that notwithstanding the very rapid operation of electric typewriters the ribbon will not be thrown upwardly any farther than is desired.

Our improvements are also applicable to manually operated typewriters, as shown in Fig. 4. The key lever 78 may be connected as shown at 119 to the sub-lever 83′ which is pivoted at 84 to the machine frame 85. The rear end of the key lever may be pivoted at 92 to the machine frame 91 and be provided with a restoring spring 93. At 90 is pivoted to the machine frame 91 a rock shaft 94 which is secured to a bell crank 95′ having a lateral extension 120 under the key lever 78 so that when the latter is depressed the bell crank 95′ will be rotated on the pivot 90 in an anti-clockwise direction. Pivoted at 98 to the bell crank 95 is another bell crank 97 which has a screw and slot adjusting connection at 96. When the lever 78 is depressed to engage the extension 120 the bell crank 95′ will by reason of its connection at 96 and 98 act against the spring 99 to move down the forward extending arm of the bell crank 97 which forward extending arm is pivoted at 102 to the lower end of the link 103.

Downward movement of the link 103 being thus secured by depressing manually any one of the key levers 78, the ribbon vibrator may be operated to either the position represented by the slot 116 or the position represented by the slot 118, or when the slot 117 is over the pin 110 the ribbon will not be moved upwardly which, as above explained, is the position for stenciling.

It should be understood that during the operation of the ribbon vibrator there is no lost motion between the bell crank lever 97 and the crank arm 95, the slot 96 being for the purpose of affording adjustment of the bell crank lever 97 relative to the crank arm 95. After such adjustment is made the set screw 121 is tightened to hold the crank arm 97 rigidly connected to the arm 95 to move therewith. Therefore when the arm 89 moves, the rock shaft 94 and the bell crank 97 move therewith, being rigidly connected to the arm 89. In other words, since the arm 89, rock shaft 94, arm 95 and bell crank 97 are rigidly connected together, forward movement of the universal bar 88 will immediately impart downward movement to the pivot 102 and therefore to the link 103.

A retracting spring 122 is connected between the crank arm 111 and the bracket 123 which is connected rigidly to the machine frame. An adjustable abutment or stop screw 124 is mounted on the bracket 123 in position to engage the rear upper edge of the rear arm of the bell crank 111 to adjust the ribbon to its initial position. The stop screw 124 may be held in adjusted position by means of the nut 125. The spring 122 therefore acts as a restoring spring for the ribbon vibrator so that immediately after the type has struck the platen the release of the pull of the actuating members 81 on the bar 88 will permit the spring 122 to return the ribbon vibrator to its lower position. The spring 99 also acts upon the release of the bar 88 to restore the lever 89 to its initial position. When this occurs the pin 110 will be engaged by the bottom edge of the slot in the slotted head 109, thereby limiting the upward movement of the link 103 and the rearward movement of the arm 89.

It should be understood that the part designated 88 is in reality a universal bar in that it extends between bracket arms 89 at the sides of the machine frame so that all of the actuating members 81, one for each of the key levers 78, may hook over the universal bar 88 by means of the extensions 87. In the form shown in Fig. 4, the part designated 120 is a universal bar extending between the brackets 95′ at the sides of the machine frame so that depression of any of the key levers 78 will move down the universal bar 120.

In the application of Otto A. Hokanson, Serial No. 738,982, filed September 22, 1924, now Patent No. 1,691,063, granted November 13, 1928, for an improvement in typewriters, the ribbon vibrator stop plate 47 and the mechanism for operating it are shown, described and claimed, and so also the spring 39 and mechanism associated therewith for yieldingly holding the line finder against the platen, but in the present application the improvements reside more particularly in associating with the line finder and ribbon vibrator simpler more efficient mechanism for operating the ribbon vibrator to properly

position it for different color zones of the ribbon and for stenciling, when the printing is being done in upper case and when it is being done in lower case, both in an electrically operated typewriter and in a manually operated typewriter.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of the invention as defined by the claims hereto appended and we wish therefore not to be restricted to the precise construction herein disclosed.

Having thus fully disclosed an embodiment of our invention, what we desire to secure by Letters Patent of the United States is:

1. In a typewriter, in combination with the frame of the machine, a ribbon vibrator, a universal bar, a lever adapted to be moved by the movement of the said universal bar, a relatively long link adapted to be pivoted in one end of said lever, said link having an inverted T-shaped slot in its upper end and having a laterally projecting arm substantially intermediate its length, a lever pivoted at one end to said arm, a second lever pivoted to the opposite end of said lever, said second lever being pivotally mounted on a rock shaft, a platen-shifting member, a substantially cradle-shaped lever pivotally carried on said platen-shifting member, a bell crank lever pivotally mounted on the frame of the machine and having one arm thereof carrying a pin lying in the inverted T-shaped slot of the link, the other arm of the bell crank lever being pivotally mounted to an additional lever, said additional lever being pivotally mounted in turn to the cradle-shaped lever, and a ribbon vibrator connected to the cradle-shaped lever.

2. In a typwriter, in combination with the machine frame, a key lever having its rear end pivoted to the frame, a sub-lever for operating the type bar, said sub-lever being pivoted to the frame, a restoring spring mounted on the frame and beneath the rear end of the key lever, a rock shaft pivoted to the frame, a lever pivoted to the rock shaft, a bell crank pivotally mounted on said lever and having an adjustable connection therewith, a link pivoted to said bell crank, said link having an inverted T-shaped slot at its upper end, a platen-shifting member, a ribbon vibrator lever pivotally carried by the platen-shifting member, a ribbon vibrator connected to said ribbon vibrator lever, an upper bell crank pivotally mounted on the frame of the machine and having an arm carrying a pin lying in the slot of the link, the second arm of the upper bell crank having a lever pivoted thereto, said lever being pivotally connected to the ribbon vibrator lever, and means operable upon a depression of the key lever for actuating the sub lever and for shifting the rock shaft, whereby to actuate the link.

3. In an electric typewriter, the combination with a power roller, of a key lever, an actuating member, means operated by said key lever for connecting said actuating member to said power roller, a type bar, a sub-lever connected to said actuating member and to said type bar, a hooked extension for said actuating member, a universal bar engaged by said hooked extension, a ribbon vibrator, and means conected between said universal bar and said ribbon vibrator for operating the latter.

4. In a typwriter, in combination with the machine frame, a key lever having its rear end pivoted to the frame, a sub lever connected to said key lever, said sub-lever being pivoted to the frame, a restoring spring mounted on the frame and beneath the rear end of the key lever, a rock shaft pivoted to the frame, a first bell crank pivoted to the rock shaft, said bell crank having a lateral extension underlying the key lever, a second bell crank pivoted to the first bell crank and having an adjustable connection therewith, a link pivoted to the second bell crank, said link having an inverted T-shaped slot therein, a platen-shifting member, a ribbon vibrator lever pivotally carried thereon, a ribbon vibrator connected to said ribbon vibrator lever, a third bell crank pivotally connected to the machine, one arm of said third bell crank having a pin lying in the slot of said link, and the other arm of said third bell crank having a lever pivoted thereto, said lever being pivotally connected to the ribbon vibrator lever.

5. In a typewriter, the combination with a key lever, of a type bar, a sub-lever connected to said type bar for actuating the same, an actuating member connected to said sub-lever, a power shaft, means for connecting said actuating member to said power shaft upon the depression of said key lever, a hooked extension on said actuating member, a universal bar engaged by said hooked extension when said sub-lever actuates said type bar, a ribbon vibrator, and means connected between said universal bar and said ribbon vibrator for operating the latter in unison with the operation of the type bar.

6. In a typewriter, the combination with a key lever, of a type bar, mechanism for operating the type bar upon the depression of said key lever, a hooked extension from said operating mechanism, a universal bar engaged by said hooked extension, a ribbon vibrator, and means comprising an oscillating actuating member connected to said universal bar for operating said ribbon vibrator.

7. In a typewriter, the combination with a key lever, of a type bar, means for operating said type bar upon the depression of said key

lever, a hooked extension from said operating means, a universal bar engaged by said hooked extension, a bell crank pivoted to the frame of the machine and having one arm supporting said universal bar, a ribbon vibrator, and means connected to said bell crank for operating said ribbon vibrator.

8. In a typewriter, the combination with a constantly rotating power shaft, of a key lever, an actuating member, means operated by said key lever for connecting said actuating member to said power shaft, a type bar, a sub-lever connected to said actuating member and to said type bar, an extension for said actuating member, a ribbon vibrator, and means connected between said extension and said ribbon vibrator for operating the latter.

9. In a typewriter, the combination with a key lever, of a type bar, mechanism for operating the type bar upon depression of the key lever, an extension from said operating mechanism, a universal bar engaged by said extension, a ribbon vibrator, and means comprising an oscillating actuating member connected to said universal bar for operating said ribbon vibrator.

10. In a typewriter, the combination with a key lever, of a type bar, means for operating said type bar upon depression of said key lever, an extension from said operating means, a universal bar engaged by said extension, a bell crank pivoted to the frame of the machine and having means for supporting said universal bar, a ribbon vibrator, and means connected to said bell crank for operating said ribbon vibrator.

In testimony whereof we have signed our names to this specification on this 31st day of December, A. D. 1928.

OTTO A. HOKANSON.
JAMES F. KOCA.