

Feb. 20, 1951

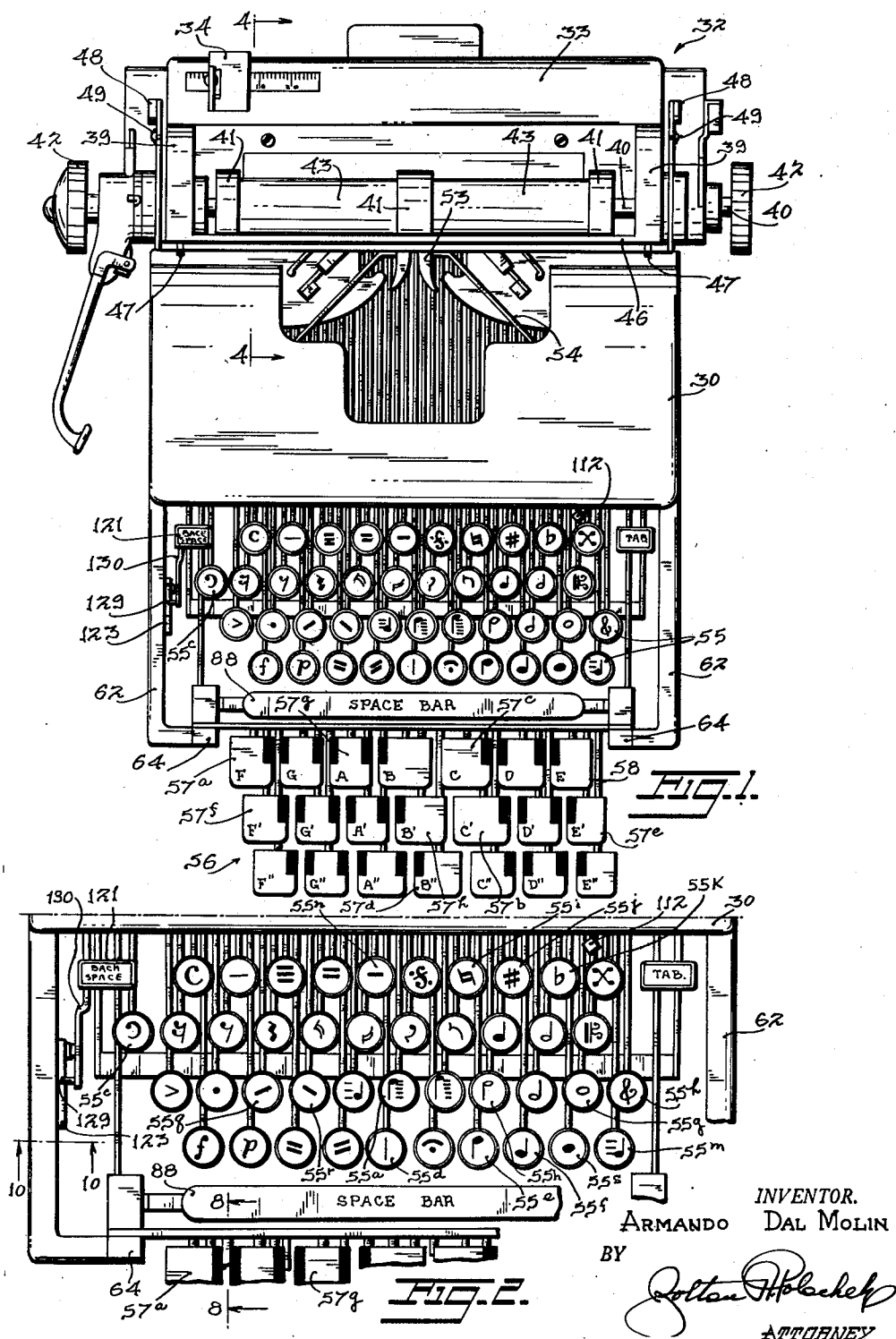
A. D. MOLIN

2,542,632

TYPEWRITER FOR TYPING MUSIC NOTES

Filed April 14, 1948

4 Sheets-Sheet 1



Feb. 20, 1951

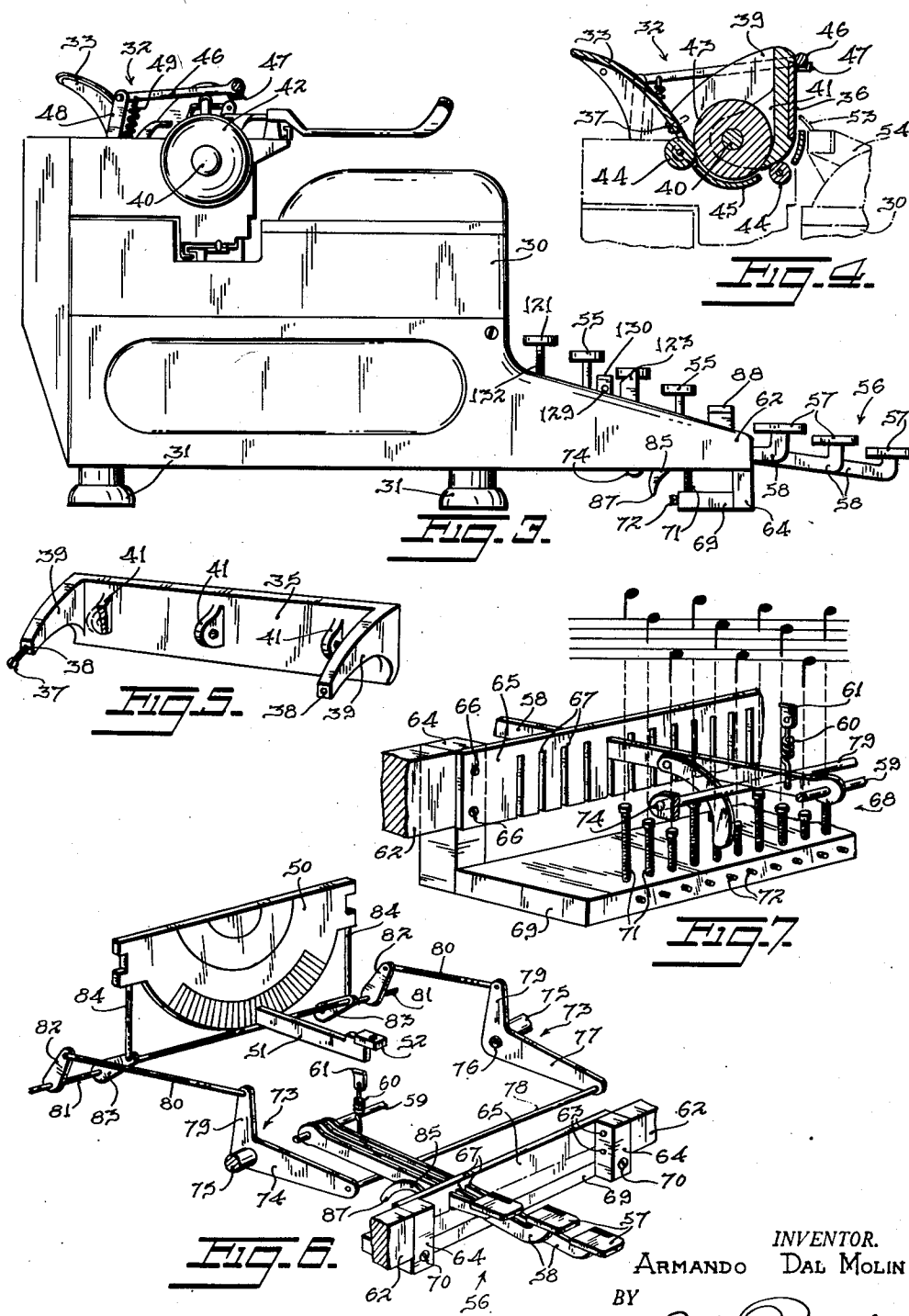
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2,542,632

TYPEWRITER FOR TYPING MUSIC NOTES

Filed April 14, 1948

4 Sheets-Sheet 2



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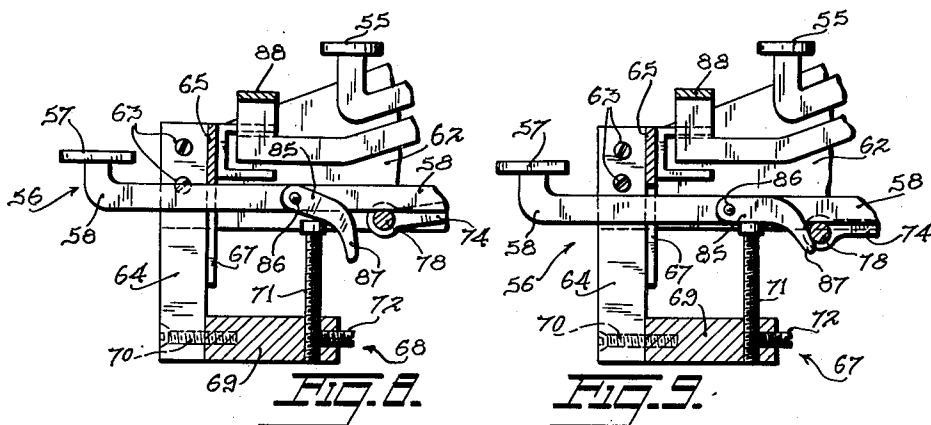
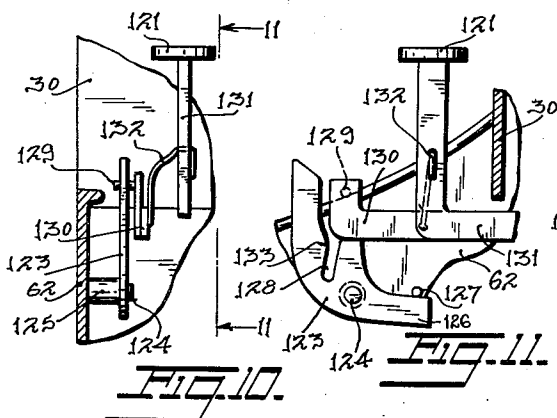
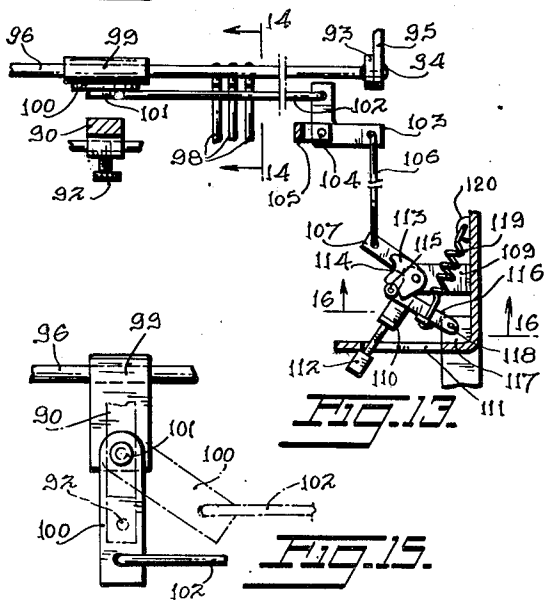
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TYPEWRITER FOR TYPING MUSIC NOTES

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4 Sheets-Sheet 3



Feb. 20, 1951

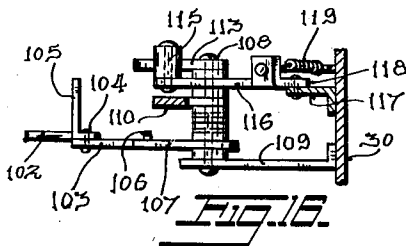
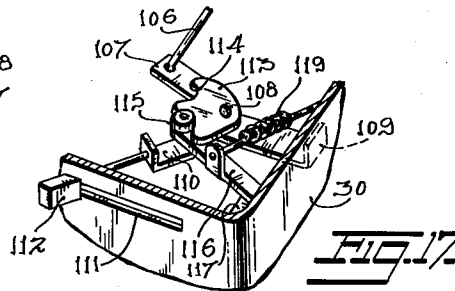
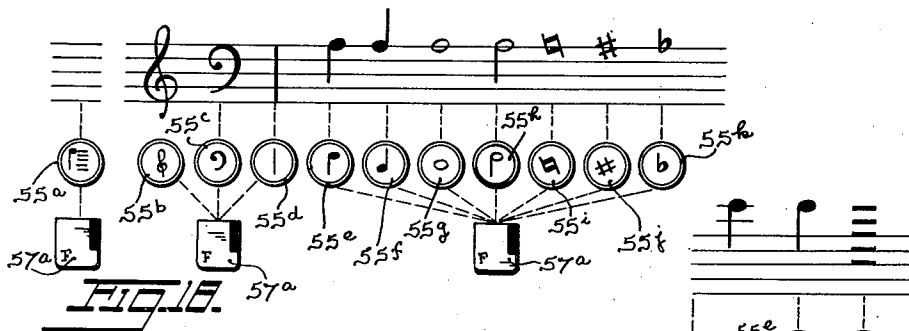
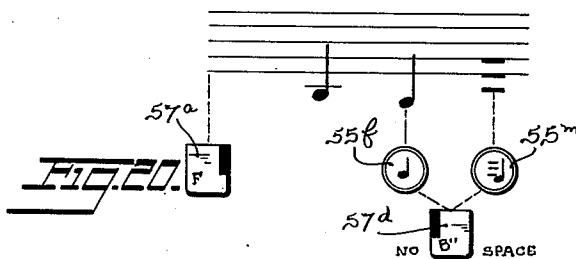
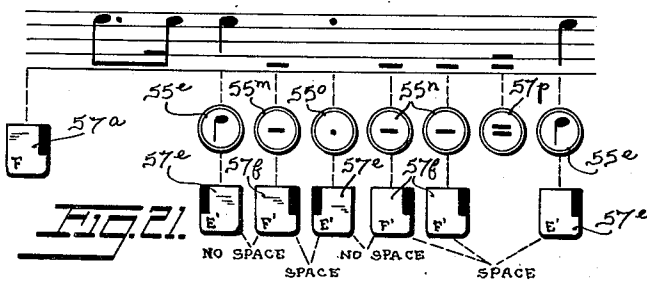
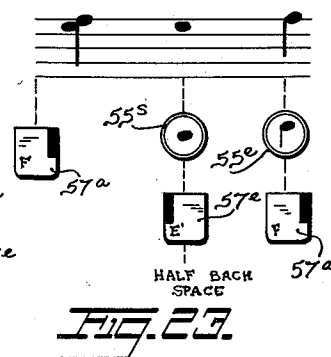
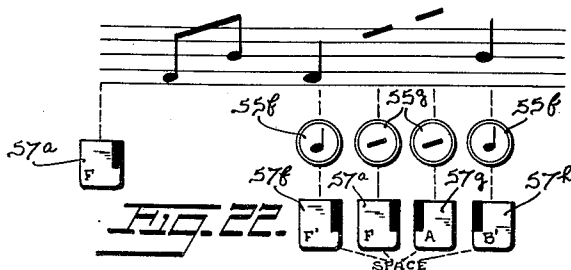
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TYPEWRITER FOR TYPING MUSIC NOTES

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4 Sheets-Sheet 4



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TYPEWRITER FOR TYPING MUSIC NOTES

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Application April 14, 1948, Serial No. 20,963

12 Claims. (Cl. 197—8)

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This invention relates to new and useful improvements in a typewriter for typing music.

More specifically, the present invention proposes the construction of a typewriter for typing complete musical scores including all the music symbols thereof, which symbols will be directly typed by manipulation of one of the type bars or by combining one or more of the type bars as will become apparent as this description proceeds.

Another object of this invention is to construct a typewriter having a flat platen for supporting a sheet of paper upon which a musical staff can be typed and means for varying the relationship between the flat platen and the type bars in a manner to permit the music symbols to be typed on the staff in their proper positions.

It is still another object of this invention to provide the typewriter with an auxiliary keyboard at the front of the normal keyboard, which controls the manipulation of the type bars, connected with the type bars in a manner to be used for shifting the type bars as a unit for varying their alignment with the flat platen.

A further object of the invention proposes arranging the keys of the auxiliary keyboard in banks of seven keys each comprising an octave of the musical scale in a manner to permit the desired key to be easily picked out by the operator of the typewriter to be depressed for typing a desired music symbol in a proper position on the musical staff.

Still further the present invention proposes interposing a linkage system between the keys of the auxiliary keyboard and the basket of type bars which terminates in a bar extended beneath the keys of the auxiliary keyboard to be depressed in a manner to move the linkage and shift the basket of type bars down a distance comparable with the distance the key of the auxiliary keyboard was moved.

Still another object of this invention proposes the provision of a novel lock arranged in connection with each of the keys of the auxiliary keyboard for engaging and holding the bar of the linkage system in a manner to lock the linkage system to hold the basket of type bars from bouncing vertically during rapid manipulation of the typewriter causing music symbols to be typed in other than the desired positions.

Another object of the present invention proposes the provision of an adjustable stop for each of the keys of the auxiliary keyboard which stops are individually adjustable in a manner to limit downward depression of the keys of said auxiliary keyboard to a desired amount.

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The present invention also proposes the provision of a novel means for holding the carriage carrying the flat platen back spaced one-half a space in a manner to leave the hands free to be used to manipulate the type bars or the keys of the auxiliary keyboard.

Still another object of the present invention proposes the provision of a novel mechanism for preventing the carriage carrying the flat platen from advancing to the left each time a type bar strikes the platen in a manner to permit two or more music symbols to be typed in one space.

The present invention also proposes the construction of a novel typewriter for typing music which can be conveniently used for transposing music without the exercise of any special skill on the part of the operator.

It is a further object of this invention to construct a typewriter for typing musical scores which is durable and simple in operation and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a plan view of a typewriter for typing music constructed in accordance with the present invention.

Fig. 2 is an enlarged detailed view of the main keyboard portion of the typewriter.

Fig. 3 is a side elevational view of the typewriter looking from the left side of Fig. 1.

Fig. 4 is an enlarged partial vertical sectional view through the platen taken substantially on the line 4—4 of Fig. 1.

Fig. 5 is a rear perspective view of the flat platen member.

Fig. 6 is a perspective diagrammatic view showing the mechanism for vertically shifting the basket of type bars.

Fig. 7 is an enlarged perspective view of a portion of the basket shifting mechanism looking in at the adjustable stops.

Fig. 8 is an enlarged partial vertical sectional view taken on the line 8—8 of Fig. 2.

Fig. 9 is a view similar to Fig. 8, but illustrating a different position of the parts.

Fig. 10 is an enlarged partial vertical sectional view on the line 10—10 of Fig. 2 showing the mechanism for holding the back space key in a

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position in which the carriage will be locked one-half space back or to the right.

Fig. 11 is a sectional view taken on the line 11—11 of Fig. 10.

Fig. 12 is a view similar to Fig. 11 but showing a different position of the parts.

Fig. 13 is a plan view, showing a portion of the main frame of the typewriter in section, of the mechanism for preventing the normal carriage advancing mechanism from advancing the carriage, when desired, upon manipulation of a type bar.

Fig. 14 is a sectional view taken on the line 14—14 of Fig. 13.

Fig. 15 is a sectional view taken on the line 15—15 of Fig. 14.

Fig. 16 is a sectional view taken on the line 16—16 of Fig. 13.

Fig. 17 is an enlarged partial sectional perspective view of a portion of Fig. 13.

Fig. 18 is a schematic illustration showing the alignment of various musical symbols typed on a normal staff with one key of the auxiliary keyboard depressed.

Figs. 19 to 23 are schematic illustrations showing the method of forming some common musical symbols on the typewriter constructed in accordance with the present invention.

The typewriter for typing music, according to the present invention, includes the usual typewriter frame 30 having the usual feet 31 for supporting the typewriter on a desk, table or other support. Mounted on the frame 30 for lateral movement relative to the frame is the usual carriage 32. Details of the mounting of the carriage will not be given in this specification as they form no part of this invention and such details are generally known to those versed in the art.

The carriage 32 includes the usual paper rest 33 upon which the usual paper guide 34 is slidably mounted and against which the left-hand margin of a piece of paper is engaged for guiding the insertion of the piece of paper into the carriage. Attached to the paper rest 33 is a flat platen member 35 preferably made of wood, metal or other similar material. A piece of fiber material 36 is set into the front face of the platen 35 and is adapted to be engaged by the typing heads of the typing keys. The flat platen member 35 is secured in position on the paper rest 33 by means of screws 37, see Fig. 5, which pass through the paper rest 33 and threadedly engage complementary openings 38 formed in rearwardly extending side arms 39 of the flat platen member 35. The carriage supports a rod 40 which passes through complementary bosses 41 formed on the back face of flat platen 35. The side arms 39 of the flat platen 35 are arched to engage over the ends of the rod 40. At the sides of the carriage 32, the rod 40 is formed with the usual knobs 42 which can be manually gripped for turning the rod. Fixedly mounted on the rod 40 between the bosses 41 of the flat platen 35 there are paper feed rollers 43. Cooperating with the paper feed rollers 43 are the usual idler rollers 44 and guides 45, see Fig. 4, for guiding a sheet of paper into typing position on the flat platen 35. A U-shaped paper support member 46 has its intermediate arm extended across the face of the flat platen 35 at the top thereof and rested on short pegs 47 extending from the top corners of the flat platen 35. The side arms of the paper support member 46 extend rearwards and at their rear ends are pivotally attached to

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brackets 48 extending from a portion of the carriage 32. Springs 49 operate between the rearwardly extending arms of the paper support member 46 and a portion of the carriage 32 and urge the paper support member into contact with the short pegs 47 on the front of the flat platen 35. The U-shaped paper support member 46 can be lifted against the action of the springs 49 to permit a piece of paper to be typed on to be engaged therebeneath to be supported in proper typing position.

Slidably mounted for vertical movement upon a fixed portion of the frame 30 of the typewriter is the usual type bar support member 50 and supported thereon for pivotal movement in a substantially vertical plane are the usual type bars 51, only one of which has been included in the schematic showing of Fig. 6. The manner of supporting the frame 50 for vertical movement is not shown in the accompanying drawings as such sliding movements are generally known to those skilled in the art, it being deemed sufficient to say that the support 50 slides vertically; that is, vertically relative to the flat platen 35. The support 50 and the type bars 51 form what is generally known as a movable basket type typewriter construction.

Attached to the free ends of the type bars 51 there are typing heads 52, and these typing heads 52 are arranged to enter the usual V-shaped guide 53 which is associated with the usual typewriter ribbon 54, see Fig. 1, to type upon a sheet of paper supported on the flat platen 35. Linkages, not shown, are interposed between the type bars 51 and the usual typing keys 55 disposed to the front of the frame 30 of the typewriter. The typing heads 52 have embossed thereon the music symbols corresponding to those carried by the typing keys 55 shown on an enlarged scale in Fig. 2. Thus, as each of the typing keys 55 is depressed the symbol of that key will be typed on the piece of paper supported on the flat platen 35.

Instead of the usual shift keys for shifting the support member 50 vertically to vary the alignment of the typing heads 52 with the flat platen 35, an auxiliary keyboard 56 is provided at the front of the machine and to the front of the typing keys 55. The auxiliary keyboard 56 comprises a number of shift keys 57 arranged in banks of seven keys each. Each bank of keys comprises an octave of the music scale, and while three banks are shown on the accompanying drawings it is pointed out that the keys may be arranged in banks of more or less number and still be operative for the intended purpose.

Each of the shift keys 57 of the auxiliary keyboard 56 is mounted on the forward end of an arm 58 pivotally supported at its rear end upon a support rod 59 mounted upon a fixed portion of the typewriter frame 30. Springs 60, see Fig. 7, operate between the arms 58 and a fixed portion 61 of the typewriter frame 30 for holding the arms in their raised positions.

Means is provided for guiding vertical movement of the arms 58 as the shift keys 57 are depressed. In this connection, it will be noted from Figs. 1, 2 and 6 that the usual frame 62 which extends around the typing keys 55 has been cut away at the front of the typewriter, providing an opening for the passage of the arms 58 of the auxiliary keyboard 56. Attached to the ends of the forwardly projecting portions of the frame 62, by means of screws 63, are depending blocks 64. Attached to the inner sides of

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the depending blocks 64 is a plate 65. The plate 65 is secured in position by means of screws 66, see Fig. 7. Extended upwards from the bottom edge of the plate 65 there are a plurality of slots 67. There is one slot 67 for each of the arms 58 of the auxiliary keyboard 56 and the arms 58 extend through the slots 67 as shown in Figs. 6 to 9 to have their vertical movements guided by the slots.

An adjustable stop 68 is provided for arresting the depression of each of the shift keys 57 of the auxiliary keyboard 56. To support the stops 68 a horizontal plate 69 is secured to the lower ends of the depending blocks 64 by means of screws 70. Threadedly engaged through the back edge of the horizontal plate 69 there are a plurality of vertical stop screws 71, one below each of the arms 58 of the auxiliary keyboard 56. These vertical stop screws 71 are in rear alignment with the slots 67 of the plate 65 through which the arms 58 extend. Set screws 72 are threadedly engaged in from the back edge of the plate 69 and are adapted to be tightened against the vertical stop screws 71 to hold them in desired adjusted positions. In Fig. 7 there is schematically shown the manner of adjusting the vertical stop screws 71 to limit the downward depression of the shift keys 57 to obtain the desired proper alignment of the typing heads with the lines of the conventional music staff.

Interposed between the arms 58 of the auxiliary keyboard 56 and the type bar support member 50 is a linkage system 73, see Fig. 6, for moving the type bar support member 50 vertically as the shift keys 57 of the auxiliary keyboard 56 are depressed. The linkage system 73 is characterized by spaced bell crank levers 74 pivotally supported at the junction of their arms on bosses 75 by means of pins 76. The bosses project towards each other from a fixed portion of the typewriter frame 30. The horizontal arms 77 of the bell crank levers extend along the sides of the group of arms 58 of the auxiliary keyboard 56. A bar 78 is supported between the free ends of the horizontal arms 77 of the bell crank levers 74. The bar 78 extends beneath the arms 58 and is in contact with the bottom edges of those arms, as shown in Fig. 8. Thus, when one of the shift keys 57 is depressed its respective arm 58 will be correspondingly moved until downward motion is arrested by engagement of the bottom edge of the arm 58 with the top end of the vertical stop screw 71 of the respective arm 58 which has been depressed. Since the bottom edge of that depressed arm is in contact with the bar 78 the bar will be similarly moved downwards to pivot the bell crank levers 74 about their pivot pins 76.

The other arms 79 of the bell crank levers 74 extend vertically upwards and have their free ends connected to rearwardly extending connecting members 80. A shaft 81 is turnably supported at its ends (not shown) upon fixed portions of the frame 30 of the typewriter. Substantially vertically extending arms 82 are fixedly mounted at their bottom ends upon the shaft 81 and have their upper ends connected to the rear ends of the rearwardly extending connecting members 80. Also fixedly mounted on the shaft 81, inwards of the substantially vertically extending arms 82, is a second pair of substantially horizontally extending arms 83. The free ends of the horizontally extending arms 83 are in turn connected by means of vertically extending connecting rods 84 to the type bar

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support member 50. When the bell cranks 74 are pivoted as hereinbefore described, the bell cranks will draw on the connecting members 80 and the substantially vertically extending arms 82 to turn the shaft 81 and correspondingly turn the substantially horizontally extending arms 83 in a downward direction to pull downwards on the connecting rods 84 and move the support member 50 and type bars 51 downwards a distance corresponding to the distance the arm 58 of the auxiliary keyboard 56 was depressed before its downward motion was arrested by its engagement with its respective vertical stop screw 71. The support member 50 is connected with its usual means for again lifting it and restoring the linkage system 73 to its starting position when the pressure on the keys 57 is relieved. The arms 58 will be restored to their starting positions by their respective springs 60, see Fig. 7.

As the type basket comprising the support 50 and the type bars 51 is rather heavy, the type basket displays a tendency to bounce vertically relative to its guides when the machine, and particularly the shift keys are manipulated rather rapidly. If a type key 55 should be depressed while the type basket is bouncing vertically, the tendency is for the musical symbol to be typed in a position other than the correct position for the particular shift key which has been depressed. To eliminate this objectionable bouncing of the type basket, a lock is provided for gripping and holding the bar 78 of the linkage system 73 in the full depressed position of the particular shift key which has been depressed. This lock comprises a lock lever 85 for each of the arms 58 of the auxiliary keyboard, and each lock lever 85 is pivotally attached to its respective arm 58 by means of a pin 86 and the lock levers 85 depend freely downwards and rest on the top ends of the respective vertical stop screws 71 of the arms 58. The lock levers 85 also have depending tail portions 87 which extend downwards along the front of the bar 78. The tail portions 87 are of a sufficient length to extend in front of the bar 78 in all of its depressed positions, so as to preclude the possibility of any of the lock levers becoming engaged behind the bar 78 when the bar 78 is moved downwards by depression of one of the shift keys 57. Only one of the lock levers 85 is shown in Figs. 8 and 9, but it will be appreciated that the lock levers will extend downwards at different angular positions depending upon the adjustment of the stop screws 71 of the respective arms 58 to which the lock levers 85 are pivotally attached.

The inoperative position of the lock levers 85 is shown in Fig. 8 of the drawings; however, when one of the shift keys 57 is depressed its respective arm 58 will move downwards moving the bar 78 downwards also. The respective lock lever 85 will not move downwards because of its engagement with the top end of the respective stop screw 71, as shown in Fig. 8. Downward movement of the arm 58 will fulcrum the lock lever 85 about its pivot pin 86 and its point of engagement with the top of the stop screw 71 and project its tail portion 87 upwards and rearwards to engage substantially beneath the bottom of the bar 78, as shown in Fig. 9. This will cause the bar 78 to be gripped between the adjacent edges of the arm 58 and the lock lever 85 and hold the lock lever and in turn the support member 50 and type bars 51 against bouncing as previously described.

The typewriter has the usual mechanism controlled by the movement of the type keys 55 for advancing the carriage 32 one space to the left each time one of the type bars 51 is pivoted to cause its respective type head 52 to strike the flat platen 35. However, in using the present typewriter to type musical scores it is sometimes necessary to strike two or more type keys 55 in the same space to form a desired music symbol, and then it is necessary that the carriage not move between these strikings. Accordingly, the machine is provided with mechanism for rendering the carriage moving mechanism inoperative when desired. The type keys 55 include the usual space bar 88 at the front of the machine, connected with the usual mechanism for advancing the carriage 32 one space to the left without the necessity of striking one of the type keys 55. The operation of the space bar 88 is not affected by the mechanism of the present machine which renders inoperative the spacing mechanism controlled by the type keys 55 for moving the carriage to the left.

Details of the spacing mechanism controlled by the type keys 55 and the mechanism of the present typewriter for rendering the spacing mechanism inoperative are shown in Figs. 13 to 17. The spacing mechanism is shown somewhat schematically, as such spacing mechanisms are common in the field of typewriter construction. The spacing mechanism includes a rack 89 (shown in dot and dash lines in Fig. 14) attached to the carriage 32 and extended from side to side of the typewriter. A pivotally mounted dog 90 has its upper end engaging the teeth of the rack 89 and is urged into an operative position by means of a spring 91. The dog 90 also controls the usual escapement mechanism, not shown, for insuring that the carriage will be advanced one tooth of the rack 89 each time the dog 90 is pivoted to disengage the rack 89. The lower end of the dog 90 carries an adjustment screw 92 for adjusting the sensitivity of the dog 90 and its escapement mechanism.

Depending arms 93 are attached pivotally at their upper ends by means of pins 94 to brackets 95 extending from fixed portions of the typewriter frame 30. Vertically spaced horizontal rods 96 and 97 are extended between the depending arms 93. Hook members 98 extend from the linkages (not shown) which connect the type bars 51 with the type keys 55 and extend over the bottom horizontal rod 97 as shown in Figs. 13 and 14 for pulling on the bottom horizontal rod 97 and pivoting the depending arms 93 each time one of the type keys 55 is depressed. Fixed to the top horizontal rod 96 in alignment with the dog 90 is a depending lever 99. Pivotally attached to the lower end of the depending lever 99 is an extension member 100. The depending lever 99 and the adjacent end of the extension member 100 are pivotally connected together by means of a pin 101. Thus, when the depending arms 93 are pivoted forward by one of the hook members 98, the extension member 100 will also be moved forward to strike the adjustment screw 92 and pivot the dog 90 against the action of the spring 91 and move the top end of the dog 90 to disengage the rack 89 and free the carriage 32 to move one space to the left.

Mechanism is provided for pivoting the extension member 100 from the full line operative position shown in Fig. 15 to the dot and dash line inoperative position shown in that figure. In the inoperative position the extension mem-

ber 100 will be out of direct line with the adjustment screw 92 thus preventing the extension member from engaging the adjustment screw 92 when the arms 93 are pivoted forward by the hook members 98. The mechanism for pivoting the extension member 100 comprises a connecting link 102 attached at one end to the bottom end of the extension member 100 and extended to one side of the frame 30 of the machine. The other end of the connecting link 102 is connected to one arm of a bell crank lever 103 pivotally attached by means of a pin 104 to a bracket 105 extending from a fixed portion of the typewriter frame 30. The other arm of the bell crank lever 103 is connected to a forwardly extending connecting link 106, which is in turn connected to an arm 107. The arm 107 is fixedly attached to the lower end of a vertical pin 108 which is rotatively supported at its lower end in a bracket 109 attached to the frame 30 of the typewriter. Fixedly mounted on the pin 108 above the arm 107 is a control arm 110 which extends through a slot 111 formed in the front wall of the frame 30 of the typewriter. The projected end of the control arm 110 is formed with a knob 112 which can be manually gripped for moving the control arm 110 from one end to the other of the slot 111. Such movement of the control arm 110 through the medium of the intervening linkage shown in Figs. 13 to 17 will move the extension member 100 between the operative and inoperative positions shown in Fig. 15.

Means is provided in connection with the pin 108 to hold the control arm 110 in position at either end of the slot 111 to correspondingly hold the extension member 100 in either an operative or inoperative position. This means comprises a cam 113 fixedly mounted on the top end of the pin 108 and provided with a pair of cam notches 114. A roller 115 is engageable with either of the cam notches 114 and is rotatively supported on one end of a lever 116. The opposite end of the lever 116 is pivotally mounted on a fixed bracket 117 by means of a pin 118. A spring 119 operates between an intermediate portion of the lever 116 and a fixed lug 120 for urging the lever 116 into a position in which its roller will engage the edge of the cam 113 and more particularly retain the roller 115 in engagement with one of the cam notches 114. When the control arm 110 is at one end of the slot 111, the roller 115 will engage in one of the cam notches 114 and when the control arm 110 is at the other end of the slot 111 the roller 115 will engage the other of the cam notches 114.

The typewriter also has the usual back space key 121, see Figs. 1, 2 and 10 to 12, associated with the usual mechanism for causing the carriage 32 to be back spaced one space each time the back space key 121 is depressed. In typing music with the present typewriter it is sometimes necessary to back the carriage up one-half space in order to form a desired musical symbol, as will become apparent as this description proceeds. Ordinarily this is done by holding the back space key 121 partially depressed while striking the desired type key with a finger of the free hand. However, as both hands are required for the operation of the present typewriter, one for depressing the desired type key 55 while the other holds the desired shift key 57 of the auxiliary keyboard 56 in a depressed position, it is necessary that some means be provided for holding the back space key 121 in its partially depressed position to hold the carriage 32 spaced back one-

half space. A novel lock 122, illustrated in detail in Figs. 10 to 12, is provided for this purpose.

The lock 122 comprises a holding element 123 which is pivotally supported by means of a pin 124 upon a boss 125 which projects from the frame 62. In its forwardly pivoted position a rearwardly extending arm 126 of the holding element 123 is adapted to engage a stud 127 projecting from the frame 62 and limit forward pivoting. The holding element 123 is formed with a cam cutout 128 into which a pin 129 of a lever 130 is adapted to be engaged as shown in Fig. 12. The lever 130 has a pivotal attachment at a point, not shown, which is concentric with the point of pivoting of the rearwardly extending arm 131 of the back space key 121. It is the arm 131 that is connected to the back space mechanism of the typewriter which is not shown on the drawings. The lever 130 and the arm 131 are connected together for unitary movement by means of a length of stiff wire 132. When the pin 129 enters the cam cutout 128 as shown in Fig. 12 it will be disposed beneath a bulge 133 on the forward wall defining the cam cutout 128 so as to hold the pin 129 in position in the cam cutout 128.

To hold the back space key 121 in the half back space position, the back space key is depressed with one hand while simultaneously pivoting the holding element 123 rearwards about its pivot pin 124 causing the pin 129 to enter the cam cutout 128 and be simultaneously engaged beneath the bulge 133. When the pin reaches the bottom end of the cam cutout the carriage will be back spaced one-half space and will be retained in this position by reason of the engagement of the pin 129 beneath the bulge 133. This leaves the hands of the operator free to be used to manipulate the desired type key 55 and the desired shift key 57 of the auxiliary keyboard 56. To release the back space key 121 it is merely necessary to pull forward on the upwardly extending portion of the holding element 123 which causes the pin 129 to ride out of the cam cutout 128. While the pin 129 is shown mounted on a lever 130 having pivotal support independent of the arm 131 of the back space key 121 it is appreciated that the lever 130 could be integrally formed with the arm 131 to move vertically therewith.

All of the mechanical features of the typewriter of the present invention for typing musical scores have now been described and the following is a description of the method used for typing several musical symbols with the present typewriter:

Figs. 18 to 23 illustrate the principles involved in typing music with the present invention. Referring first to Fig. 18, this figure illustrates the manner of forming the various musical symbols on the typing heads 52 of the type bars 51. The typing key 55^a, see Fig. 2, controls a type bar 51 which has a type head 52 provided with five vertically spaced short horizontal lines, and when the key 55^a is successively depressed with the shift key 57^a of the auxiliary keyboard 56 held in a depressed position, a normal music scale will be typed on a sheet of paper supported on the flat platen 35. The shift key 57^a corresponds to F of the music scale; that is, the F above middle C, which is the shift key 57^b of the auxiliary keyboard 56, and which key is marked C' in Fig. 1. As each bank of keys in Fig. 1 form a complete octave and as the banks are one octave lower from the back to the front of the

machine, the like keys of each bank have been marked for identification purposes with the additions of primes in the two lower banks; as for example, F, F', and F'', and so on.

There are certain musical symbols which achieve no particular significance from their position on the music scale and those symbols when typed with the F shift key 57^a depressed will appear in their normal position on the normal music scale. This is illustrated, for example, at the left of Fig. 18 where the treble clef, controlled by the type key 55^b; the bass clef, controlled by the type key 55^c; and the vertical line controlled by the type key 55^d are shown in their normal positions on the music scale—both the scale and the symbols having been typed with the F shift key 57^a of the auxiliary keyboard 56 depressed.

There are other music symbols which achieve special significance from their position on the music scale and those symbols when typed with the F shift key 57^a depressed will be typed on the top or F line of the normal music scale. This is illustrated for example at the right of Fig. 18, where the quarter note with the tail down, controlled by the type key 55^e; the quarter note with the tail up, controlled by the type key 55^f; the whole note, controlled by the type key 55^g; the half note with the tail down, controlled by the type key 55^h; the natural, controlled by the type key 55ⁱ; the sharp, controlled by the type key 55^j; and the flat, controlled by the type key 55^k are shown typed in position on the top or F line of the music scale—and again, both the scale and music symbols have been typed with the F shift key 57^a of the auxiliary keyboard 56 depressed.

In Fig. 19, there is illustrated a quarter note typed in the high C position with relation to the normal scale with the additional lines typed above the normal scale to position the quarter note. As previously described, the normal scale is typed with the type key 55^a and with the F shift key 57^a of the auxiliary keyboard 56 held in a depressed position. The quarter note in the high C position is typed with the type key 55^e and with the high C shift key 57^c of the auxiliary keyboard depressed. The extension of the scale above the normal scale is obtained by using the type key 55^a, which was used to type the scale in the normal position, but this time with the high C shift key 57^c depressed, instead of the F shift key 57^a. This will print the scale segment with two lines extended above the normal scale and with the three lower lines overlapping the top three lines of the normal scale as indicated by the darkened areas in Fig. 19. As it is necessary that both the quarter note and the extension of the scale be typed in the same space, to produce the finished arrangement shown at the left of Fig. 19, the knob 112 is moved to the right side of the slot 111, see Figs. 13 and 17, to move the extension member 100 to the dot and dash line position shown in Fig. 15 to prevent the carriage from being moved one space to the left between depressions of the keys 55^e and 55^a. After depression of the key 55^e, the knob 112 may again be moved to the left of the slot 111, so that when the key 55^a is depressed the carriage will be spaced one space to the left, so that the next music symbol will not be typed over the one just completed.

As this description continues, it is to be understood that the term "normal scale" means the scale that will be obtained by typing with the

type key 55^a and with the F' shift key 57^a of the auxiliary keyboard 56, held in a depressed position. It is apparent that the type key 55^a will have to be manipulated with the finger of one hand, while the F' shift key 57^a is held depressed with a finger of the other hand.

In Fig. 20 there is illustrated the method of typing a quarter note in the low B position with relation to the normal scale and the additional lines typed below the scale to position the quarter note. The quarter note is typed with the type key 55^a and with the B' shift key 57^d held depressed. The additional line below the normal scale is obtained by using the special type key 55^m, which has only three line segments for use in typing additional lines below the scale. Again, when depressing the key 55^m, the B' shift key 57^d is held depressed, and this will type an additional line below the normal scale with two lines overlapping the lower two lines of the normal scale. As the quarter note and the additional line are superimposed, the knob 112 is moved to the right end of the slot 111 so that there will be no spacing of the carriage, one space to the left, following the depression of the type key 55^a and the knob 112 is then returned to the left end of the slot 111 so that there will be the normal movement of the carriage 32 following the depression of the type key 55^m.

Fig. 21 illustrates the method of forming connected three-sixteenths and one-sixteenth notes on a normal scale. To form this connected note, the quarter note with tail down is typed by using the type key 55^a while holding the E' shift key 57^e in the lowered position—the shift key 57^e represents E on the scale above middle C. With the knob 112 at the right of the slot 111, so that there will be no space after the quarter note, the knob 112 is again moved to the left and the first portion of the connecting line is added to the lower end of the tail of the quarter note. This is done by using the type key 55^a while holding the F' shift key 57^f in the lowered position—the key 57^f represents F below middle C on the music scale. As the knob 112 was moved to the left side of the slot, the carriage 32 will be advanced one space to the left. The formation of the music symbol is continued by now placing the dot to the right of the head of the quarter note just typed, and this is done by using the type key 55^a while again holding the E' shift key 57^e depressed; at the same time the knob 112 is disposed in the right hand end of the slot 111 so that the carriage 32 will not be advanced. The knob 112 is then moved back to the left hand end of the slot 111 and left there to complete the formation of the connected note. Two more portions are added to the connecting line by depressing the type key 55^a twice with the F' shift key 57^f held depressed. The connecting line is then completed by a double line portion which is typed with the type key 55^a while again holding the F' shift key depressed. The connected note is then completed by again typing a quarter note in the E above middle C position by using the type key 55^a with the E' shift key 57^e in the depressed position. This will position the downwardly extending portion of the tail of the note immediately adjacent the end of the double line segment of the connecting line.

In Fig. 22 there is illustrated the method of forming one-eighth notes connected by an inclined line on a normal scale. This connected note is typed with the knob 112 at the left of the slot 111 as a movement of the carriage to the

left is required between each portion of the note. To start the formation of the note, a quarter note is first typed in the F position below middle C, by using the type key 55^a while holding the F' shift key 57^f in the lowered position. The first segment of the inclined line is then added to the top end of the upwardly extending tail of the quarter note by using the type key 55^a while holding the F' shift key 57^f depressed. The final segment of the inclined connecting line is added by using the type key 55^a, but this time the A shift key 57^g is used so that the second segment of the connecting line will be in alignment with the end of the first segment. The formation of the symbol is then completed by typing the final quarter note in the B below middle C position by using the type key 55^a while holding the B' shift key 57^b in the lowered position.

It is appreciated that connected notes can be formed with the connecting line inclined downwards using the same method described in connection with Fig. 22 except that the type key 55^a is used and the shift keys 57 of the auxiliary keyboard 56 are decreased by two notes instead of advancing up the scale by two notes as described in connection with the connected note shown in Fig. 22.

In Fig. 23 there is illustrated the method of forming an additional quarter note on the left-hand side of the vertical stem of a normal quarter note, again on a normal scale. To form this type of a note it is necessary that the carriage be moved back one-half space in order to form the added note in the proper position. To move the carriage back the one-half space and hold it in that position, the back space key 121 is partially depressed and held in the partially depressed position by engaging the pin 129 in the cam cutout 128 below the bulge 133 (see Figs. 10 to 12). This will hold the carriage back-spaced one-half space to the right and leave the operator's hands free to manipulate the type keys 55 and the shift keys 57 of the auxiliary keyboard 56. With the back space key 121 held depressed a solid note without a stem is typed in the E above middle C position by using the type key 55^a while holding the E' shift key 57^e depressed. The back space key 121 is then released by pulling forward on the upstanding end of the holding element 123 which will cause the pin 129 to ride out of the cam cutout 128 freeing the carriage 32 to advance the one-half space to the left. The formation of the note is then completed by typing the usual quarter note with the depending tail by using the type key 55^a while holding the F' shift key 57^f in a depressed position.

The foregoing description of forming the various notes in the various positions on the musical scale is by way of illustration only, and it is appreciated that the position of the various notes on the scale may be changed by using other shift keys of the auxiliary keyboard 56 and that other musical symbols in desired positions on the musical scale can be formed by using other combinations of type keys and shift keys.

The typewriter in accordance with the present invention may also be conveniently used for transposing music without the exercise of any special skill on the part of the operator. This can be easily accomplished by typing the scale in the key in which it is desired to transpose the music and then typing the notes in the key in which the sheet of music was written and they will appear in their proper position on the transposed scale.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, and means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard.

2. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, and means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, said auxiliary keyboard having its keys arranged in three banks with seven keys in each bank comprising one octave of the music scale.

3. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically

aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, and means limiting downward depression of the individual keys of said auxiliary keyboard so that musical symbols typed with a desired key depressed will appear in their proper relation to a music staff.

4. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, and means limiting downward depression of the individual keys of said auxiliary keyboard so that musical symbols typed with a desired key depressed will appear in their proper relation to a music staff, said limiting means comprising an adjustable stop for each of the keys of said auxiliary keyboard and located below said keys to be engaged by the keys when depressed.

5. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, means limiting downward depression of the individual keys of said auxiliary keyboard so that musical symbols typed with a desired key depressed will appear in their proper relation to a music staff, said limiting means comprising an adjustable stop

for each of the keys of said auxiliary keyboard and located below said keys to be engaged by the keys when depressed, and means for guiding vertical movement of said keys to insure engagement of each of said keys with its respective adjustable stop when depressed.

6. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, means limiting downward depression of the individual keys of said auxiliary keyboard so that musical symbols typed with a desired key depressed will appear in their proper relation to a music staff, said limiting means comprising an adjustable stop for each of the keys of said auxiliary keyboard and located below said keys to be engaged by the keys when depressed, and means for guiding vertical movement of said keys to insure engagement of each of said keys with its respective adjustable stop when depressed, said means guiding vertical movement comprising a fixedly mounted plate extended at right angles to said keys and formed with vertical slots through which said keys pass, said slots being in alignment with the adjustable stops.

7. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, and means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, each of said keys of said auxiliary keyboard including a pivotally mounted arm and said linkage system terminating in a bar extended at right angles to said pivotally mounted arms and engaging the bottom edges of all of said arms when in its raised

position, whereby when one of said keys is depressed said bar will be moved therewith to correspondingly move said linkage system and shift said basket of type bars vertically.

8. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, each of said keys of said auxiliary keyboard including a pivotally mounted arm and said linkage system terminating in a bar extended at right angles to said pivotally mounted arms and engaging the bottom edges of all of said arms when in its raised position, whereby when one of said keys is depressed said bar will be moved therewith to correspondingly move said linkage system and shift said basket of type bars vertically, and means for locking said bar to a depressed arm when in its fully depressed position for holding said basket of type bars from bouncing during rapid manipulation of said keys.

9. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, said latter-mentioned means comprising an auxiliary keyboard at the front of the main frame having a plurality of keys arranged in octaves corresponding to the octaves of the music scale, and a linkage system interposed between said basket of type bars and said keyboard for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, each of said keys of said auxiliary keyboard including a pivotally mounted arm and said linkage system terminating in a bar extended at right angles to said pivotally mounted arms and engaging the bottom edges of all of said arms when in its raised position, whereby when one of said keys is depressed said bar will be moved therewith to correspondingly move said linkage system and shift said basket of type bars vertically, and means for locking said bar to a depressed arm

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when in its fully depressed position for holding said basket of type bars from bouncing during rapid manipulation of said keys, said locking means comprising lock levers mounted on said pivotally mounted arms at points adjacent the points of contact of said arms with said bar, said levers normally resting on a fixed support below said arms to be pivoted when said arms are depressed and engage beneath said bar for clamping said bar between the adjacent edges of said arms and said lock levers.

10. In a typewriter for typing music, a main frame, a flat platen for supporting a sheet of paper mounted on a carriage shiftable laterally of the main frame, a basket of type bars slidably mounted for vertical movement relative to said flat platen, said type bars being pivotally mounted for movement towards said platen and formed with printing heads carrying musical symbols for typing on a sheet of paper on said platen when pivoted, means for pivoting said type bars, means for shifting said basket of type bars vertically to vary the vertical alignment of said type bars and said platen causing said musical characters to be typed in different vertically aligned positions in the various shifted positions of said basket of type bars, and means for holding said carriage spaced back a half space leaving the hands free to manipulate the type bars and the keys of said auxiliary keyboard.

11. In a typewriter for typing music having a main frame supporting a carriage to be shiftable laterally thereof, a flat platen for supporting a sheet of paper mounted on the carriage, a basket of type bars slidably mounted for vertical movement relative to said platen with each type bar being pivotally mounted for movement toward the platen and formed with a printing head carrying a musical symbol for typing on a sheet of paper on the platen when the type bar is pivoted, means for individually pivoting said type bars, an auxiliary keyboard having a plurality of keys mounted on pivotally mounted arms and arranged in octaves corresponding to the octaves of the music scale, a linkage system interposed between the arms of said auxiliary keyboard and said basket of type bars and terminating in a bar extended at right angles beneath said pivotally mounted arms for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, lock levers mounted on said pivotally mounted arms at points adjacent the points of said arms engaged by said bar and having the free ends extended beneath said bar, and a fixed support below said pivotally mounted arms upon which said lock levers normally rest, whereby when one of the keys is depressed pivoting its respective pivotally mounted arm the respective lock lever will be pivoted relative to the pivoted arm due to its engagement with said fixed support for clamping said bar between the bottom edge of

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the pivoted arm and the top edge of the respective lock lever to hold the basket of type bars from bouncing during rapid manipulation of the keys of said auxiliary keyboard.

12. In a typewriter for typing music having a main frame supporting a carriage to be shiftable laterally thereof, a flat platen for supporting a sheet of paper mounted on the carriage, a basket of type bars slidably mounted for vertical movement relative to said platen with each type bar being pivotally mounted for movement toward the platen and formed with a printing head carrying a musical symbol for typing on a sheet of paper on the platen when the type bar is pivoted, means for individually pivoting said type bars, an auxiliary keyboard having a plurality of keys mounted on pivotally mounted arms and arranged in octaves corresponding to the octaves of the music scale, a linkage system interposed between the arms of said auxiliary keyboard and said basket of type bars and terminating in a bar extended at right angles beneath said pivotally mounted arms for shifting the basket of type bars a desired vertical distance for each depression of a key of said auxiliary keyboard, lock levers mounted on said pivotally mounted arms at points adjacent the points of said arms engaged by said bar and having the free ends extended beneath said bar, and a fixed support below said pivotally mounted arms upon which said lock levers normally rest, whereby when one of the keys is depressed pivoting its respective pivotally mounted arm the respective lock lever will be pivoted relative to the pivoted arm due to its engagement with said fixed support for clamping said bar between the bottom edge of the pivoted arm and the top edge of the respective lock lever to hold the basket of type bars from bouncing during rapid manipulation of the keys of said auxiliary keyboard, and adjustable stops beneath said pivotally mounted arms of said auxiliary keyboard to be engaged by the respective pivoted arm when its respective key is depressed, said stops also forming said fixed support upon which said lock levers rest.

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