

March 17, 1953

R. H. KEATON  
MUSIC TYPING MACHINE

2,631,712

Filed Jan. 3, 1949

4 Sheets-Sheet 1

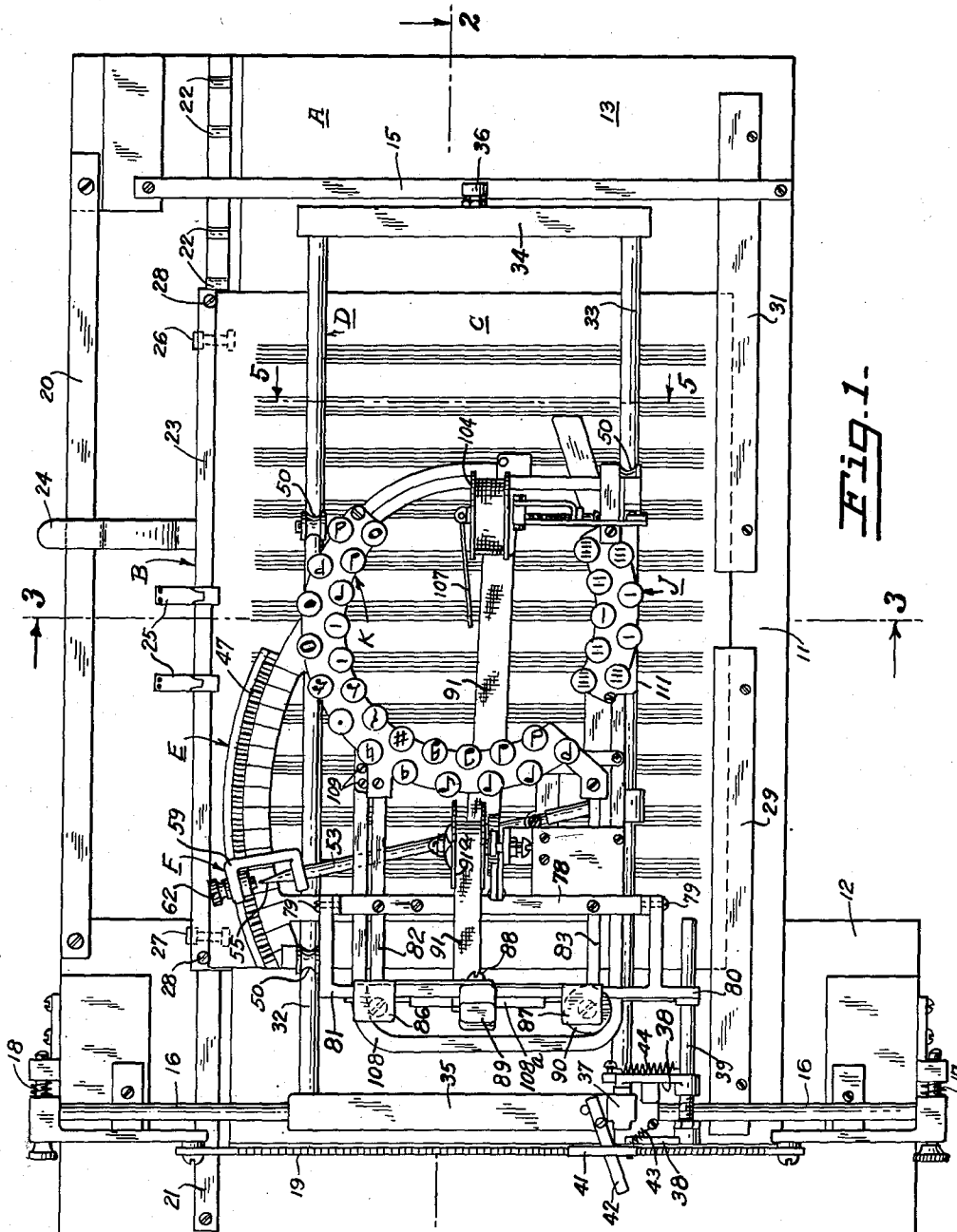


Fig. 1.

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4 Sheets—Sheet 2

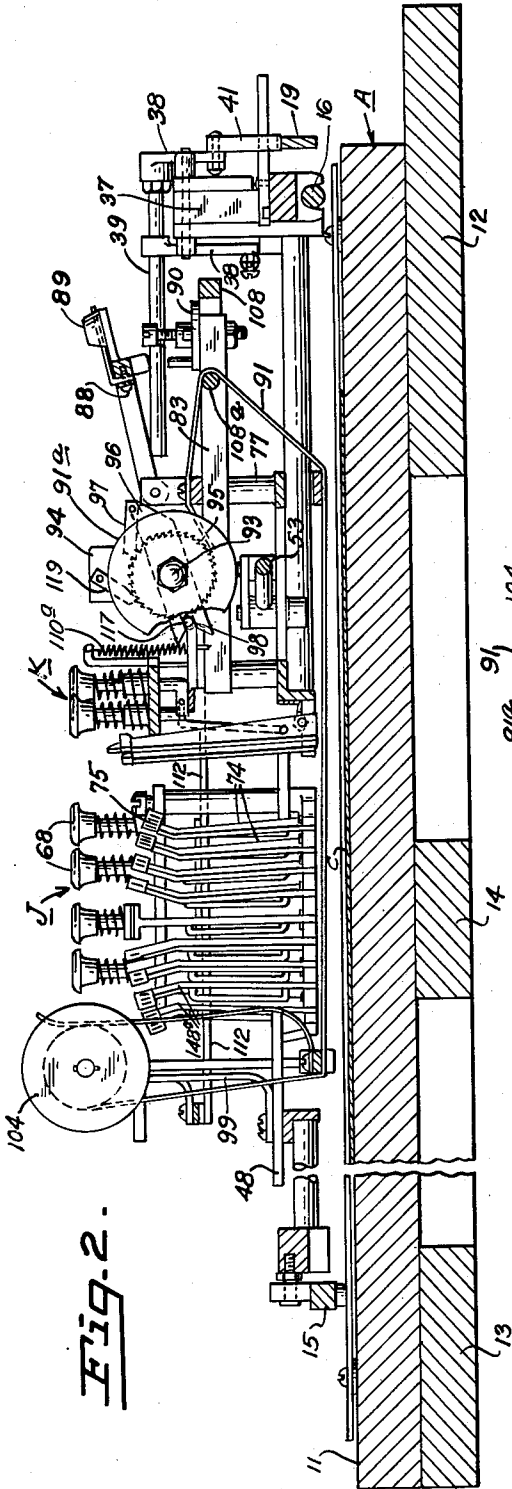


Fig. 2.

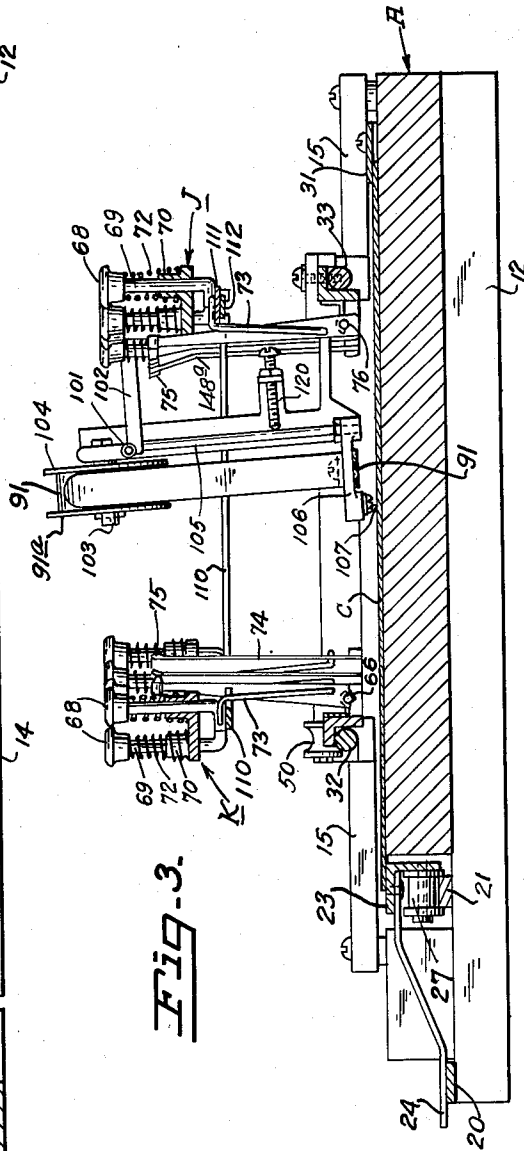


Fig. 3.

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4 Sheets-Sheet 3

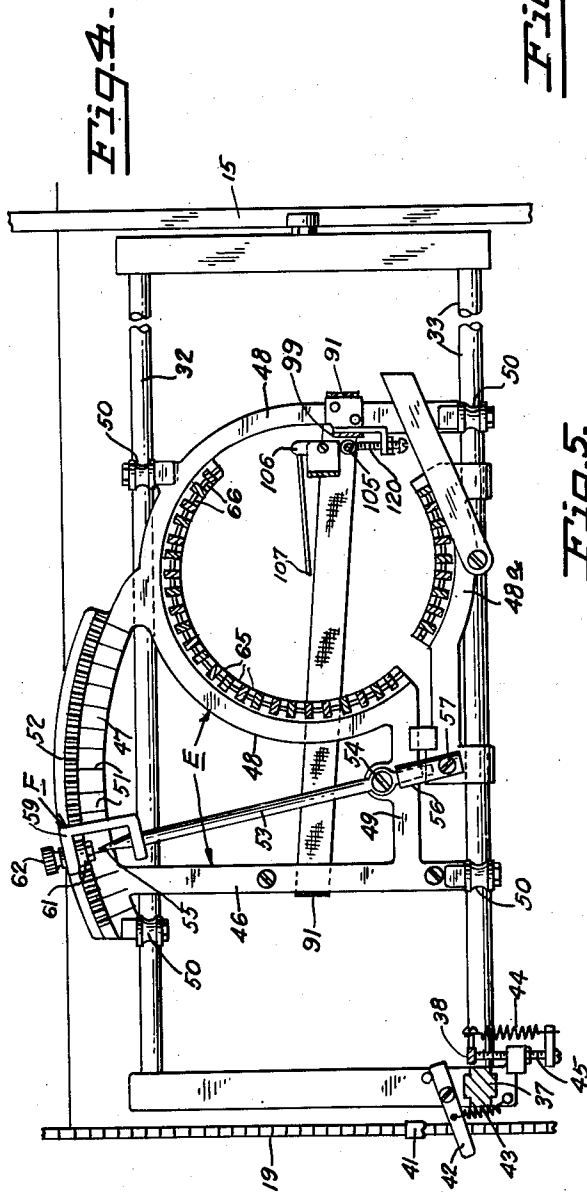


Fig. 4.

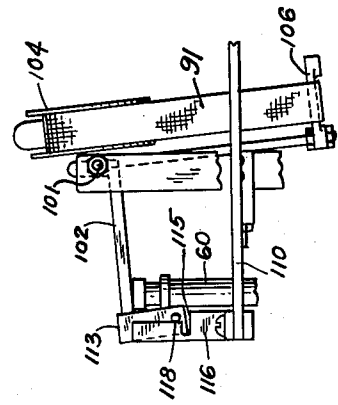


Fig. 6.

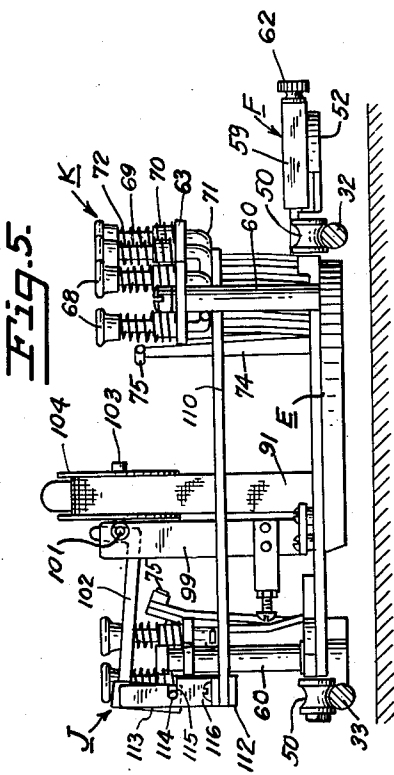


Fig. 5.

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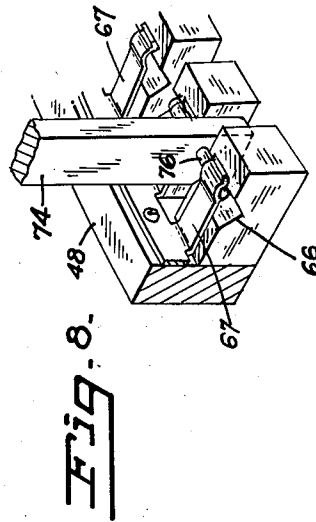
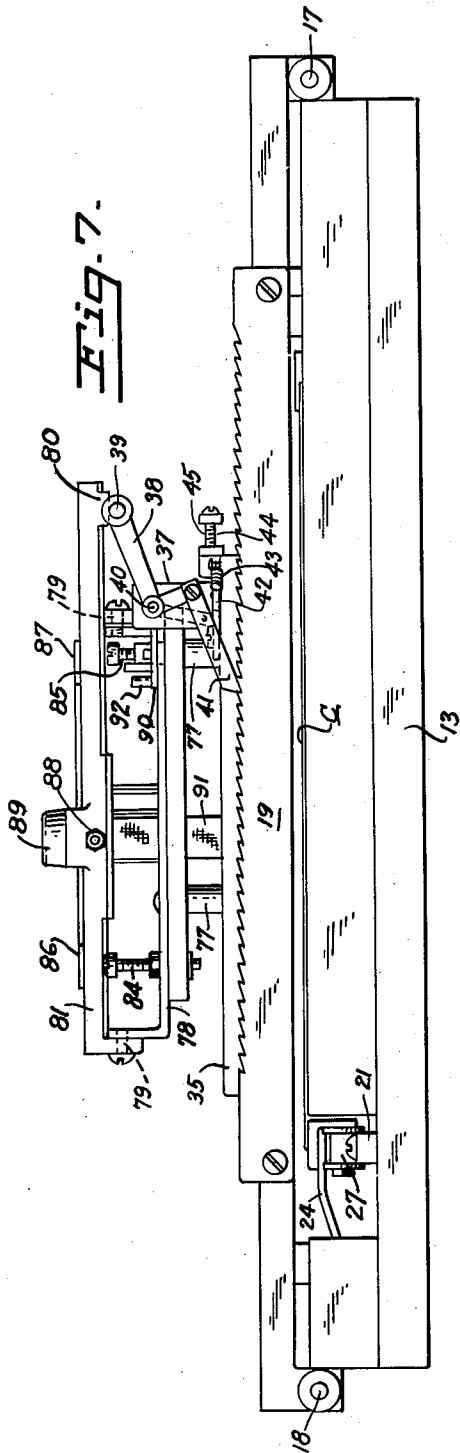
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4 Sheets-Sheet 4



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# UNITED STATES PATENT OFFICE

2,631,712

## MUSIC TYPING MACHINE

Robert H. Keaton, San Francisco, Calif.

Application January 3, 1949, Serial No. 68,967

10 Claims. (Cl. 197-8)

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This invention relates to an improved typewriter adapted to type musical notes and characters on musically staffed paper.

A principal object of the present invention is to improve generally on that type of music typing machine which forms the subject matter of my U. S. Patent No. 2,047,690, dated July 14, 1936.

In typing musical characters or figures, provision must be made in the typewriter to space the characters both longitudinally and laterally with respect to the paper, and in view of the fact that musical characters are written on a staff comprising five closely spaced staff lines and four spaces between the lines, it is essential that provision be made to print the musical notes and characters in exact position upon the paper. Another object, therefore, of the present invention is to provide means in a music typewriter for shifting the keys thereof both laterally and longitudinally with respect to the paper and to provide means to indicate the exact typing locus on the paper whereat the next musical character will be typed.

Another principal object and advantage of the present invention is to provide in a music typewriter a novel means for shifting a typewriter ribbon into operative position only upon depression of a typewriter key to permit normal visual access to the particular point or typing locus on the paper whereat the next note will be typed.

Another object is to provide in a music typewriter a novel keyboard arrangement whereby one keyboard is adapted to type one class of musical characters, such as bar lines and ledger lines, which, when repeated, always appear in the same relative spaced positions with respect to the lines comprising a chosen staff in a direction longitudinally of the paper and a second keyboard adapted to type another class of musical characters, such as the notes, rest signs and sharp and flat signs etc., which may, when repeated, appear in various spaced positions with respect to the lines comprising a chosen staff in a direction longitudinally of the paper. The particular advantages attained in employing such a novel keyboard arrangement will be more fully explained hereinafter.

Another object is to provide a novel and efficient means for mounting a type bar in a frame of a typewriter.

Other objects of the present invention are to provide a music typewriter capable of typing a great many musical characters on a sheet of staffed paper, which is compact in size, rugged in construction, which requires relatively few ma-

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chined parts and which is relatively inexpensive to manufacture.

Other advantages and objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views:

In the drawings:

Fig. 1 is a plan view of the invention.

Fig. 2 is an enlarged fragmentary sectional view taken on line 2-2 of Fig. 1 showing some of the parts partly broken away.

Fig. 3 is an enlarged fragmentary sectional view taken on line 3-3 of Fig. 1.

Fig. 4 is a plan view of the base plate and lower carriage members and showing other parts of the typewriter partly broken away.

Fig. 5 is an enlarged fragmentary view partly in section taken on line 5-5 of Fig. 1 and showing in detail a part of the ribbon shifting mechanism.

Fig. 6 is an enlarged fragmentary view showing the operation of that portion of the ribbon shifting mechanism illustrated in Fig. 5.

Fig. 7 is a rear elevational view of the invention.

Fig. 8 is a fragmentary view in perspective showing the manner in which a type bar is supported in a frame.

### *Construction and operation of the base plate and movable paper holder*

The base plate, indicated generally at A, in the drawings, comprises a flat table part 11, having attached to the bottom thereof and extending transversely thereof end support members 12 and 13 and a central transverse support member 14. Extending transversely across the top of the table part 11 are a front trackway 15 and a rear trackway 16, which said latter element is mounted adjustably movable in a direction toward and away from the said front trackway by means of adjusting screws 17 and 18. Extending upwardly above the top of the rear trackway 16 and rearwardly thereof is a notched bar or ratchet 19 which is supported at its opposite ends by adjustable screw assemblies 17 and 18.

Extending lengthwise of base plate A and positioned to the left and slightly below the table part 11 is a trackway 21 which is provided throughout about one half of its length thereof with a plurality of equi-distantly spaced notches or grooves 22. The distance between adjacent notches 22 may be made to correspond exactly

to the distance between adjacent staffs on the sheet of paper on which the composition is to be typed, and for reasons which will appear hereinafter.

A paper holder, indicated generally at B, comprises more specifically an elongated angle bar 23, a laterally projecting handle member 24 and a plurality, preferably two, of paper spring clamps 25. Attached to the underside of angle bar 23 and depending therefrom are a pair of rollers 26 and 27, which, in turn, are suitably flanged at their ends to engage trackway 21 of base plate A.

In operation, the sheet of staff paper, indicated generally at C, may be securely clamped to angle bar 23 by clamps 25 in such manner that the edge of the paper is in parallel alignment with the edge of the said angle bar. Upwardly extending lugs 28 may be provided at each end of the angle bar to serve as stop means and against which the edge of the paper may be moved to aid in aligning the paper parallel to the edge of the angle bar as aforesaid. The paper holder and the staffed sheet of paper C may be moved longitudinally with respect to the table part 11 by appropriate manual movement of handle 24 which is slidably supported by a bar 20 which is provided on the base plate for this purpose. Roller 26 is adapted to engage and nest into any one of the notches 22 provided on bar 21, and as has hereinabove been pointed out the said notches may be spaced from each other at a distance equal to the distance between adjacent staffs to thus permit an operator to move the paper longitudinally of the base plate at intervals corresponding the space intervals existing between adjacent staffs on the paper.

In order to hold the paper perfectly flat against the table part 11, suitable paper guides, such as indicated at 29 and 31, may be attached to the table part to guide the edge of the paper opposite the edge which is clamped to the paper holder B.

#### *Construction and operation of the lower carriage and lateral spacer mechanism*

The lower carriage of the typewriter, indicated generally at D, comprises more specifically a rectangular frame consisting of a pair of parallel side trackways 32 and 33 and a pair of end connecting bars 34 and 35. End bar 34 is provided with a roller 36 which is adapted to roll along trackway 15, and the underside of end piece 35 is provided with a suitable arcuate bearing surface which is adapted to slidably engage trackway 16.

Referring now particularly to Figs. 1 and 7, numeral 37 indicates an upwardly extending boss to which is pivotally mounted adjacent its upper end a bifurcated bell crank lever 38 which, in turn, is provided with an elongated actuating arm 39. The lower end of the bell crank lever 38 has pivotally attached thereto a pawl 41 which is adapted to engage the teeth of ratchet 19. A pawl release bar 42 is pivotally attached to the top of end bar 35 and is held normally in inoperative position by means of a coil spring 43. A suitable coil spring 44 having its opposite ends attached to an arm of bifurcated bell crank 38 and to bell crank adjusting screw 45, respectively, serves to maintain the bell crank and arm 39 in maximum upward position as indicated in Fig. 7. The degree to which bell crank 38 may swing about its pivotal point 40, and the extent of movement permitted arm 39 in an upward direction may be limited by proper adjustment of screw 45, the end of which said screw is adapted

to abut against the lower arm of bell crank lever 38 and limit its movement thereby.

In operation, when arm 39 is depressed (by a mechanism which will hereinafter be described in more detail), the lower arm of bell crank lever 38 is moved to the left causing pawl 41 to bite into a tooth of ratchet 19 and force carriage frame D to the right along trackways 15 and 16. The distance between two adjacent teeth on ratchet 19 may be conveniently regarded as the equivalent of one lateral space on the typewriter, and it is evident that the number of spaces that the carriage D will be moved to the right upon a single downward stroke of arm 39 is dependent upon the length of that downward stroke—i. e., the greater the distance that arm 39 is moved downwardly, the greater will be the number of ratchet teeth that pawl 41 will move over. If it is desired to move the carriage frame D to the left (referring now to Fig. 1 particularly) an operator need only grasp the release bar 42 and move it to the left which will cam pawl 41 upwardly out of engagement with ratchet 19 and permit the carriage to be moved as far to the left as desired over trackways 15 and 16. Upon release of bar 42, pawl 41 will again drop into engagement with ratchet 19 and spacing to the right may be accomplished by successive actuation of arm 39 as hereinabove described.

#### *Construction and operation of the upper carriage and longitudinal spacer mechanism*

Referring now particularly to Fig. 5 in the drawings, the upper carriage, indicated generally at E, is supported movably along trackways 32 and 33 of lower carriage D by means of a plurality of rollers (preferably four) which are identified by the numeral 50. More specifically upper carriage E comprises end bar 46, arcuate dial 47, arcuate type bar frame 48 and connecting bar 49. The inner top edge of dial 47 is preferably marked off at given intervals with straight lines or arrows or other indicia, such as indicated at 51, whereas the outer edge of dial 47 is provided with a plurality of notches 52. Generally, I prefer to make the five center lines 51 black and make the remaining lines provided on either side of the center lines a different color, such as red for example. In addition, I prefer to provide twice as many notches 52 as there are lines or indicia 51 and to arrange the notches in such manner that one notch is positioned opposite each line 51 and a second notch is provided opposite the space between adjacent lines 51. The reason for this preferred arrangement of parts will be more fully described hereinafter.

The longitudinal spacing mechanism—i. e., the mechanism employed to move upper carriage E longitudinally with respect to the table part and the paper supported thereon—is indicated generally at F and comprises more specifically an elongated lever arm 53 pivoted as at 54 to connecting bar 49 and terminating at one of its ends in a pointer as at 55. The opposite end of lever arm 53 is disposed slidably in a sleeve 56 which, in turn, is pivoted as at 57 to type bar frame 48. Attached to the end of lever arm 53 adjacent the pointer end thereof is a U-shaped frame 59 which carries a depending wheel or roller 51 on the inner side thereof and knob 62 on the outer side thereof.

In operation, knob 62 may be employed to move lever arm 53 arcuately over dial 47 until pointer 55 is in desired registry with one of the markings 51. Accurate alignment between the pointer and

one of the markers may be rapidly accomplished by virtue of the fact that roller 61 is adapted to engage and partially nest in a notch directly opposite each of the markers or in a notch disposed opposite the space existing between adjacent markers. Thus, when pointer 55 of the lever arm is brought into near registry with any one of the markers, the roller 62 will nest neatly into place within a notch opposite the desired marker to thereby bring pointer 55 and the chosen marker into automatic accurate alignment with one another. It is evident that movement of lever arm 53 will, because of its pivotal connection 54 with upper carriage E and its slidable connection with fulcrum sleeve 56, cause upper carriage E to move correspondingly in the direction in which the lever arm is moved and in a direction longitudinally with respect to the table part of base plate A.

In connection with the construction and operation of the upper carriage and longitudinal spacer mechanism, it is noted that the markings 51 are so spaced, and the spaced mechanism F is so arranged, that movement of pointer 55 over dial 47 a distance of one marking will cause the upper carriage to move longitudinally with respect to the paper a distance exactly equal to the distance between adjacent staff lines on the paper. In view of the fact that there are two notches 52 for each marking 51, movement of lever arm 53 from one notch to the next will cause the upper carriage to be moved longitudinally with respect to the paper a distance equal to the distance between a staff line and the center of the space existing between said staff line and an adjacent staff line. Moreover, the reason I prefer to make the center five markings 51 on the dial a different color than the remaining markings is that the center five lines may be deemed representative of the five lines within a staff on the paper, and so long as the lever arm 53 is confined in movement within the center five black markings, an operator is assured that the next typed character will be printed within the limits of the staff on the paper.

*Construction and operation of the keys, the type bar frame and key frame*

The keys and type bars of the present typewriter are divided into two separate and distinct groups, indicated generally at J and K. The keys of group J in the drawings are mounted in an arcuate frame 48<sup>a</sup> which is attached immovably with respect to lower carriage D, whereas the keys which comprise group K are mounted in an arcuate frame 48 attached to upper carriage E and are, therefore, movable with respect to the keys of group J and to lower carriage D.

Each of the type bar frames is provided with an arcuate key frame 63 supported in vertical alignment with the respective type bar frames by means of post members 60. A plurality of inwardly projecting lugs 65 are provided around the inner perimeter of members 48 and 48<sup>a</sup>, and each inwardly projecting lug 65, in turn, is provided with an upwardly facing V-shaped slot, such as indicated at 66. A plurality of small spring clips, such as are indicated at 67 in Fig. 8, are attached at their inner ends to the inner sides of members 48 and 48<sup>a</sup> and are arranged in such manner that one such spring clip overlies each of the said V-shaped notches 67.

The keys of groups K and J are formed identical with one another, and each key comprises an index head 68 to indicate the musical character

which that particular key is adapted to type, and a vertical stem 69 mounted slidably in a hollow boss 70 and which said stem is bent at right angles adjacent its bottom terminal end as at 71.

It is noted that the keys which are arranged within the inner row of each group have their stems bent outwardly, whereas the keys comprising the outer row of each group are arranged with their stems bent inwardly.

Each key is also provided with a suitable coil spring 72 mounted around its stem 69 which is disposed between the top of frame member 63 and index head 68 to normally maintain the key in upwardly spring biased position. A link member 73 is connected pivotally at one of its ends to a bent end of stem 71 of each key and is connected pivotally at its opposite end to a type bar 74 adjacent the bottom end thereof. Each type bar, in turn, is formed with a printing head having a selected typing character 75 provided thereon which is adapted to strike down upon an inked typewriter ribbon to type the character upon the paper located beneath said ribbon. Each type bar is provided at its bottom end with a pressed in pivot pin 76 which is adapted to engage and nest into V-shaped slots 66 in a manner which will more fully appear.

The distance between adjacent lugs 66 of frames 48 and 48<sup>a</sup> substantially equals the width of the bottom end of a type bar 74. In assembling the type bar to frame 48 or 48<sup>a</sup> the bottom end of the type bar is inserted between a pair of adjacent lugs 66 so that opposite ends of pivot pin 76 of the type bar engage and nest in adjacent V-shaped slots 66 of the lugs and are held in nested position by spring clips 67. I have found that the round pivot pin in combination with the V-shaped slots provide a highly satisfactory pivotal connection about which a type bar 74 can swing. An advantage of such an arrangement of parts is that a minimum of machining is required to make a pivot bearing which will permit the type bar to swing downwardly in a straight line without wavering or wobbling to the right or left during a typing stroke.

In operation, depression of the index head 68 of a key will cause the stem thereof to move slidably in boss 70 and by virtue of the link connection 73 between the stem and the type bar 74, the type bar will be caused to swing around its pivotal axis 76 whereby the printing head of the type bar will strike the typewriter ribbon and impress a character on the paper beneath said ribbon. When pressure is released from the index head, coil spring 72 will urge both the type bar and the head upwardly and back to their original positions.

Arcuate frames 48 and 48<sup>a</sup> comprise a segment of a circle having a common diameter and the length of each of the type bars (as measured from pivot pin to printing head) corresponds to the length of the radius of said common circle. Because of this arrangement of parts the printing heads carried by the said type bars mounted in frame 48 will, upon actuation, swing downwardly to a common printing position or point located centrally with respect to the frame. The printing heads provided on the type bars mounted in frame 48<sup>a</sup> are preferably offset, as indicated at 148<sup>a</sup>, in such manner that the said printing heads will not move to a common centrally located printing position or point but the offset heads are preferably so constructed as to move to respective printing positions which are all located

along a common line drawn parallel to the longitudinal axis of the paper.

It should be further pointed out, however, that the centrally located printing position to which type bars supported in frame 48 all move is also located along the common line paralleling the longitudinal axis of the paper and along which said line are located the respective printing positions of the type bars mounted in frame 48<sup>a</sup> as aforesaid. The reason for this preferred arrangement of parts and the purpose of making the keys and type bars of group J immovable with respect to lower carriage D and the keys and type bars of group K movable longitudinally with respect to the paper end with respect to lower carriage D, are as follows:

In writing music certain of the musical characters and particularly the clef signs, the bar lines which indicate the end of a measure, and the ledger lines which appear above and below the staff, are always placed in the same spaced position with respect to the lines which comprise a particular staff in a direction longitudinally of the paper. Thus, musical characters of this type are adapted to be printed by the type bars mounted in frame 48<sup>a</sup>; for, regardless of movement or positioning of longitudinal spacer mechanism F, each printing head will always and repeatedly print its respective character in the same spaced position with respect to the lines comprising a chosen staff in a direction longitudinally of the paper. As previously explained the printing heads of these type bars are peculiarly offset so that the respective printing positions of each are located along a common line drawn parallel to the longitudinal axis of the paper and so that the characters printed by the respective heads will appear above or below one another on or with respect to a chosen staff.

With regard to perhaps the majority of musical characters, including the notes, sharp and flat signs, rest signs, and many others, the characters may appear repeatedly in various spaced positions with respect to the lines comprising a staff in a direction longitudinally of the paper. Thus characters of this latter type are printed on my machine by the type bars mounted in frame 48 which may be moved to various spaced positions with respect to a chosen staff both longitudinally and laterally of the paper.

#### *Construction and operation of the lateral spacer mechanism.*

Provided on end member 46 of the upper carriage are a pair of upwardly extending posts 77 to rigidly support thereon U-shaped member 78. Pivotaly attached as at 79 to opposite ends of U-shaped member 78 is U-shaped spacing bar 81 having an actuating lug 80 projecting laterally from the right end thereof which, in turn, normally rests upon arm 39 extending from bifurcated bell crank lever 38. Rigidly attached to and extending transversely of U-shaped member 78 are a pair of support bars 82 and 83 which are, in turn, provided adjacent their respective ends with adjusting screws 84 and 85. A pair of spacer keys 86 and 87 are attached pivotaly and medially of spacer bar 81 by a common pivot pin 88, and said keys are adapted to overlie, respectively, adjusting screws 84 and 85. Rigidly attached to spacer bar 81 adjacent the pivot point 88 is a central key 89.

Rotatably mounted around adjusting screw 85 is an annular disc 90 which may be provided with a plurality of stop lugs 92 which project up-

wardly from disc 90 to different heights. Disc 90 may be adjustably rotated around screw 85 in such manner that one of the lugs is positioned directly beneath and in alignment with the bottom of spacer bar 81.

The above described arrangement of parts makes it possible to obtain at least three different lateral spacings on the machine by merely selectively depressing either one of the keys 86, 87 or 89. When spacer bar 81 is depressed by pressing down on either of the keys 86, 87 or 89, projecting lug 80 bears upon and depresses arm 39 correspondingly. Manifestly the extent to which spacer bar 81 moves downwardly determines the distance that arm 39 will move, which latter movement will, in turn (as has been indicated heretofore), determine the number of spaces or distance that carriage D will be moved laterally to the right. Preferably, stop screw 84 is adjusted to a height that will permit key 86 and bar 81 to move arm 39 downwardly only sufficiently far to move carriage D to the right one space. Similarly, I prefer to adjust stop screw 85 to a height which will prohibit further depression of key 87 and bar 81 after the arm has been moved to such an extent as will cause lower carriage D to move laterally to the right a distance of two spaces. Depression of key 89 will cause the spacer bar to move downwardly against one of the stop lugs 92 on disc 90 to limit lateral movement of carriage D to three, four or five spaces, depending on which of the lugs has been adjustably aligned beneath the spacer bar as hereinabove mentioned. It is noted that when spacer bar 81 is depressed by pressing down upon key 89 adjusting screws 84 and 85 will strike against the bottoms of keys 86 and 87, but because of their pivotal mounting at 88, the keys will be forced upwardly and will not inhibit further depression of the spacer bar.

#### *Construction and operation of the ribbon winding and feeding mechanisms and ribbon shifting mechanism*

A bracket 94 extends upwardly from bar 83 and is provided with axle pin 93 to support rotatably thereon ratchet wheel 95 and attached ribbon winding reel 91<sup>a</sup>. Lever arm 96 is also rotatably mounted on axle 93 and is provided at one end with an escapement slot 98 and is provided at its other end with a pivotally mounted pawl 97 adapted to engage ratchet wheel 95 to rotate said reel in a direction to wind ribbon 91 thereon upon appropriate movement of lever arm 96. Support member 99 extends upwardly from type bar frame 48 to support adjacent its upper end thereof by means of pivot pin 101, L-shaped arm 102. Extending outwardly from the shorter leg of L-shaped arm 102 is an axle pin 103 to rotatably support a conventional typewriter ribbon unwinding reel 104, and depending downwardly from arm 102 is rod 105 which supports at its bottom end a ribbon guide 106 and a pointer 107.

U-shaped frame 108 is pivotaly hinged to bars 82 and 83 by means of an axle pin 108<sup>a</sup> and attached to the ends of the extending arms of U-shaped frame 108 by screws 109 is a ribbon shifting actuating ring 110 which has an arcuate portion thereof arranged and constructed to conform in contour to the type bar and key frame members 43 and 63. Ring 110 is normally urged upwardly by action of spring 110<sup>a</sup> against the bottoms of the bent stem portions of the keys which comprise group K and in such manner



that when any one of these keys is depressed the bent stem portions will bear against the ring to move it downwardly causing U-shaped frame member 108 to pivot about pin 108<sup>a</sup>. A segmental ring or engaging member 111 somewhat similar in construction to ring 110 is mounted slidably upon arm 112 of U-shaped member 108, and is held normally upwardly biased against the bent stems of the keys of group J. The reason for making segmented member 111 slidable with relation to arm 112 is that when the upper carriage E which carries U-shaped member 108 is moved longitudinally with respect to the keyboard of group J, member 111 will remain in contact with the bent portions of the keys comprising that group. Upon depression of any one of the keys in group J, the bent portions thereof will bear downwardly against member 111 which will, in turn, also cause ring 110 and U-shaped frame 108 to swing downwardly about its pivotal axis 108<sup>a</sup>.

Referring again to Fig. 5 it is seen that the longer arm of L-shaped member 102 connects with ring 110 by a linkage comprising member 113 depending from member 102 and pin 114 which projects from member 113 and engages escapement slot 115 provided in the upper end of support member 116, which said latter member is rigidly mounted to ring 110.

In operation, when any one of the keys 68 is depressed downwardly against either ring 110 or segment 111, U-shaped frame 108 is caused to swing downwardly about its axis 108<sup>a</sup>. Simultaneously, member 116 carried by ring 110 will move downwardly, and because of the connection between pin 114 and escapement slot 115, L-shaped member 102 will swing about its pivotal axis 101, and this latter movement, in turn, will cause rod 105 carrying ribbon guide 106 and pointer 107 to swing to the left with respect to the paper (or to the right when viewed from the front as indicated in Fig. 6). An adjustable stop screw 120 may be provided to abut against the side of rod 105 to limit the extent to which the ribbon guide and ribbon may move to the right with respect to the paper.

After ring 110 and member 116 have been moved downwardly upon depression of a key to the approximate position indicated in Fig. 6, pin 114 will disengage from notch 115 to permit further depression of ring 110, but pin 114 will, by virtue of its slidable contact against edge 118 of member 116, continue to maintain the ribbon cocked to the left with respect to the paper, as above noted. In this respect it is noted that the distance that notch 115 is moved downwardly out of engagement with pin 114 is largely dependent upon which one of the keys is depressed against ring 110 or segment member 111 to cause U-shaped member 108 to swing downwardly about its pivotal axis 108<sup>a</sup>. For example, depression of any one of the keys located nearest pin 108<sup>a</sup> will, according to commonly understood leverage principles, cause member 116 to move downwardly further than would be the case upon depression of one of the keys located further away from pivot 108<sup>a</sup>.

As heretofore noted, lever arm 96 is provided with a V-shaped cut out and escapement notch 98 that is normally in engagement with a pin 117 carried by ring 110. When ring 110 is swung arcuately downwardly upon depression of any one of the keys, lever arm 96 is moved rotatably about axis 93 in such manner that pawl 97 carried thereby drives ratchet wheel 95 in a direc-

tion to wind the ribbon off of reel 104 and on to reel 92. Although not absolutely essential to the operation of my device, I generally prefer to provide a second pawl 119 which is pivotally suspended from element 94 for the purpose of engaging ratchet wheel 95 to lock said wheel against backward rotation.

The overall operation of the typewriter is as follows: A sheet of musically staffed paper is clamped to holder B with its opposite side edge inserted between guides 29 and 31 and the table part of the base plate. The holder B together with the paper may be moved longitudinally along trackway 21 until the center of the staff which is to be typed upon is brought within close proximity of pointer 107. Preferably the adjustable spacer means F should be positioned so that pointer 55 directly overlies and registers with the center mark or point on dial 47. Adjustable screws 18 make it possible to move rear trackways 15 and the entire machine supported thereon in such manner that the end of pointer 107 is directly aligned with or points to the middle of the center line of the chosen staff when pointer 55 of the longitudinal spacing mechanism has been centrally positioned with respect to dial 47, as above suggested. Once the typewriter has been adjusted with respect to one staff on the paper in the above manner, it is only necessary to move paper holder bar 23 by means of handle 24 from one notch 22 to another in order to shift the paper longitudinally from one staff to another by virtue of the fact that the distance between adjacent notches 22 equals the distance between adjacent staffs on the paper.

The construction of the ribbon shifting mechanism, above described, is such that the pointer 107 normally indicates the central printing position of the type bar members mounted in frame 48 which said position or point, it will be recalled, is located along a common line drawn parallel to the longitudinal axis of the paper and along which said line are also located the several respective printing positions of the type bars mounted in frame 48<sup>a</sup>. Because the ribbon shifting mechanism normally maintains the ribbon to the right of the typing locus (and, therefore, to the right of the common longitudinally projected line), visual access may be had at all times thereto and to preceding typed characters except during actual typing strokes when the ribbon is shifted to the left to align itself between the printing head of a type bar and the indicated typing locus and said common line on which it is located.

Notches 52 which are engaged by roller 61 on the longitudinal spacer mechanism F are spaced at such intervals that movement of roller 61 a distance of one notch will correspondingly cause pointer 107 to move one degree up or down the scale or one half the distance between two adjacent staff lines on the paper. All lateral spacing to the right on the present typewriter is accomplished through manual operation of the spacer bar 81 having keys 86, 87 and 89, in a manner above set forth. The degree or amount of lateral spacing accomplished on each depression of spacer bar 81 is dependent upon which of the spacer keys is struck and dependent also, of course, on the adjustment which has been made on the screws 84 and 85 as well as on the position of disc 90. In writing musical passages, such as cadenzas or grace notes, it is generally desirable to provide a relatively small lateral space between successive notes along the staff, whereas

on the other hand, when a musical accompaniment to a song or score is written, the spacing between notes must necessarily be greater to allow room for printing of the words of the song.

As has been indicated, the keys which comprise group J do not move longitudinally with respect to the paper or the base plate for the reason that the characters to be typed by such keys are peculiar in that they are always repeated in the same spaced positions with respect to the lines comprising a staff in a direction longitudinally of the staffed sheet of paper. Such characters comprise, among others, the various ledger lines which are always placed the same distances above or below the staff, and the bar line (to indicate the end of a measure) which always appears as a line perpendicular to the staff line and which connects the top and the bottom lines of the staff. An obvious advantage of such an arrangement of parts is that an operator, when he desires to type characters of this latter type, need not pay attention to the position of the longitudinal spacer mechanism F when he depresses any one of the keys of group J.

Although I have described my invention in some detail by way of illustration and example and for purposes of clarity of understanding, it is understood that certain changes and modifications may be made and practiced within the scope of the invention and the appended claims.

I claim:

1. In a music typing machine the combination comprising a base plate to support a sheet of musically staffed paper thereby, a first carriage mounted movably laterally with respect to said base plate, a second carriage mounted on said first carriage and movable longitudinally with respect to said first carriage and said base plate, a first keyboard mounted on said first carriage and having individually movable typing members to type musical characters upon a said sheet of paper, and a second keyboard mounted on and movable with said second carriage and having a plurality of individually movable typing members to type musical characters on a said sheet of paper, the said individually movable typing members comprising said first keyboard arranged to type musical characters of the class which when repeated always appear in the same spaced positions relative to the several lines which comprise a staff in a direction longitudinally of a said staffed sheet of paper, the individually movable type members comprising said second keyboard arranged to type musical characters of the class which may appear repeatedly in various spaced positions relative to the several lines which comprise a staff in a direction longitudinally of said staffed sheet of paper.

2. In a music typing machine the combination comprising a base plate to support a sheet of musically staffed paper thereby, a first carriage mounted movably laterally with respect to said base plate, a second carriage mounted on said first carriage and movable longitudinally with respect to said first carriage and said base plate, a first keyboard mounted on said first carriage and having individually movable typing members to type musical characters upon a said sheet of paper, a second keyboard mounted on and movable with said second carriage and having a plurality of individually movable typing members to type musical characters on a said sheet of paper, the said individually movable typing members comprising said first keyboard arranged to type musical characters of the class which when re-

peated always appear in the same spaced positions relative to the several lines which comprise a staff in a direction longitudinally of a said staffed sheet of paper, the individually movable type members comprising said second keyboard arranged to type musical characters of the class which may appear repeatedly in various spaced positions relative to the several lines which comprise a staff in a direction longitudinally of said staffed sheet of paper, means to support an inked ribbon longitudinally of said base plate and said paper between said paper and said type members of said first and second keyboards, and ribbon shifting means associated with said last named means and said first and second keyboards to maintain normally said ribbon out of typing alignment with respect to the typing members of said first and second keyboards and to move automatically said ribbon into typing alignment with respect to said typing members upon movement of any one of said members to type a musical character on said paper.

3. In a music typing machine the combination comprising a base plate to support a sheet of musically staffed paper thereby, a first carriage mounted movably laterally with respect to said base plate, a second carriage mounted on said first carriage and movable longitudinally with respect to said first carriage and said base plate, a first keyboard mounted on said first carriage and having individually movable typing members to type musical characters upon a said sheet of paper, a second keyboard mounted on and movable with said second carriage and having a plurality of individually movable typing members to type musical characters on a said sheet of paper, the said individually movable typing members comprising said first keyboard arranged to type musical characters of the class which when repeated always appear in the same spaced positions relative to the several lines which comprise a staff in a direction longitudinally of a said staffed sheet of paper, the individually movable type members comprising said second keyboard arranged to type musical characters of the class which may appear repeatedly in various spaced positions relative to the several lines which comprise a staff in a direction longitudinally of said staffed sheet of paper, the individually movable type members comprising said first keyboard arranged to move individually to respective printing positions located along a common line drawn parallel to the longitudinal axis of said supported sheet of paper, the type members comprising said second keyboard arranged to move individually to a common printing point located along said common line, a ribbon guide to support an inked ribbon longitudinally of said base plate and said paper between said typing members and said paper, and ribbon shifting means associated with said individually movable type members of said first and second keyboards and said ribbon guide to maintain normally said ribbon shifted to a position laterally removed from said common line and to shift upon actuation of one of said typing members said ribbon into typing alignment with respect to said common line and said printing point and said printing positions located along said common line.

4. In a music typing machine the combination comprising a base plate to support thereby a sheet of musically staffed paper, a first arcuate frame supporting pivotally a plurality of individually movable type bars mounted above said base plate and movable laterally with respect thereto, a second arcuate frame supporting pivotally a plu-

rality of individually movable type bars mounted above said base plate and movable longitudinally but not laterally with respect to said first frame, said first and second arcuate frames each comprising a segment of a circle having a common diameter, each of the said type bars supported pivotally by said first and second frames having a length substantially equal to the radius of said common circle, a printing head provided at the free end of each of the said type bars supported by said first frame, the printing heads of the said type bars supported by said first frame being offset with respect to one another and arranged and constructed to swing pivotally downwardly to individual printing positions, all of said printing positions being located along a common line drawn parallel to the longitudinal axis of said paper, and a printing head provided on the free end of each of the said type bars supported by said second frame and arranged and constructed to swing pivotally downwardly to a common printing point located along said common line, the said printing heads provided on the said type bars supported by said first frame arranged to type musical characters of the class which when repeated always appear in the same relative spaced positions with respect to the lines comprising a staff in a direction longitudinally of said sheet of staffed paper, the said printing heads provided on said type bars supported by said second frame arranged to type musical characters of the class which may appear repeatedly in various spaced positions relative to the lines comprising a staff in a direction longitudinally of said sheet of staffed paper.

5. A music typing machine according to claim 4 wherein indicating means associated with said second frame is provided to normally indicate on said paper the location of said common printing point and said common line.

6. A music typing machine according to claim 4 wherein there is provided a ribbon guide to support an inked ribbon longitudinally of said base plate and a said supported sheet of paper between said paper and said type bars, and ribbon shifting means associated with all of said type bars to shift laterally upon actuation of any one of said type bars said ribbon into typing alignment with respect to said common line and said printing positions and printing point located along said common line.

7. In a music typewriter the combination comprising, a base plate to support thereby a sheet of musically staffed paper, a first frame supporting a plurality of individually movable type bars mounted above said base plate and said paper, a second frame supporting a plurality of individually movable type bars mounted above said base plate and said paper, said first frame mounted for movement toward and away from said second frame, type bar actuating members to move individually each of said type bars to a printing position, the printing positions of all of said type bars being located along a common line, a ribbon guide to support a ribbon between said paper and said type bars, a ribbon shifting member having parts thereof in normal engagement with the type bar actuating members which are adapted to actuate the type bars supported in said first frame, an engaging member mounted on said ribbon shifting member and arranged for relative slidable movement with respect thereto in the direction of movement of said first frame toward and away from said second frame, said engaging member being in normal engagement

with the type bar actuating members which are adapted to actuate the type bars mounted in said second frame, whereby operation of any one of said type bar actuating members will move correspondingly said ribbon shifting member, link means connecting said ribbon shifting member and said ribbon guide, and means comprising said ribbon guide, said ribbon shifting member, said engaging member, and said link means to shift upon operation of one of said type bar actuating members said ribbon from a first position removed from alignment with respect to said common line to a second position whereat said ribbon is placed in printing alignment with respect to said common line and said printing positions located therealong.

8. A music typing machine comprising a base to support a sheet of musically staffed paper thereby, a plurality of typing members mounted above said base and said paper, depressible keys to move individually said typing members toward said paper, means to support an inked ribbon in a first position longitudinally of said paper between said typing members and said paper, means associated with said ribbon supporting means to indicate the typing locus on said sheet of paper whereat the next character is to be typed, and means associated with said keys to shift automatically upon depression of a key said ribbon from said first position laterally into typing alignment between a typing member actuated by said key and the typing locus of said sheet of paper whereby said typing member will strike against said ribbon and print a character at the typing locus on said paper and to shift automatically upon release of said key said ribbon back to said first position whereat the typing locus on said paper and the space above and below said typing locus remains visible.

9. A music typing machine comprising a base to support a sheet of musically staffed paper thereby, a frame mounted above said base and said sheet of paper, a plurality of typing members pivotally supported by said frame, depressible keys to move individually said typing members toward said sheet of paper, a ribbon guide attached pivotally to said frame to support a ribbon in a first position longitudinally of a said supported sheet of paper between said paper and said frame, a ribbon shifting actuating member mounted on said frame movable with said depressible keys, a link to connect said actuating member to said ribbon guide, means associated with said ribbon guide to indicate the typing locus on said sheet of paper whereat the next character is to be typed, and means, including said actuating member and said link, to move upon depression of a key said ribbon guide about its pivotal axis in a direction to automatically shift laterally said ribbon from said first position into typing alignment between a typing member actuated by said key and the typing locus on the paper, whereby said typing member strikes against said ribbon to print a character at the typing locus on said paper and to shift upon release of said key said ribbon back to said first position whereat said typing locus normally remains visible.

10. A music typing machine comprising a base to support a sheet of musically staffed paper thereby, an arcuate frame mounted above said base plate and a sheet of paper supported thereby, a plurality of type members pivotally supported in row formation by said arcuate frame and arranged to swing arcuately downwardly to-

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ward a sheet of paper supported by said base, depressible keys slidably mounted in said frame to move individually said typing members toward said sheet of paper, a ring pivotally mounted on said frame and having portions adjacent the free end thereof in normal engagement with each said depressible key, a ribbon guide mounted pivotally to said frame to support an inked ribbon longitudinally of said sheet of paper between said frame and said paper, a pointer on said ribbon guide to indicate the typing locus on said paper whereat the next character is to be typed, a pin projecting outwardly from said ribbon guide, an escapement slot provided in said ring adjacent the free end thereof to normally engage said pin, 15 means to normally maintain said ribbon guide and said ribbon in a position removed from said typing locus whereby said typing locus is visible, and means including said ring, said escapement

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slot, and said pin to move automatically upon depression of one of said keys said ribbon guide pivotally about its axis to a position whereat said ribbon is shifted into typing alignment between 5 a type member actuated by said key and the typing locus on said paper.

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