Sept. 15, 1959 C. S. EFFINGER 2,904,156

MUSIC TYPEWRITER

Filed June 18, 1956 3 Sheets-Sheet 1

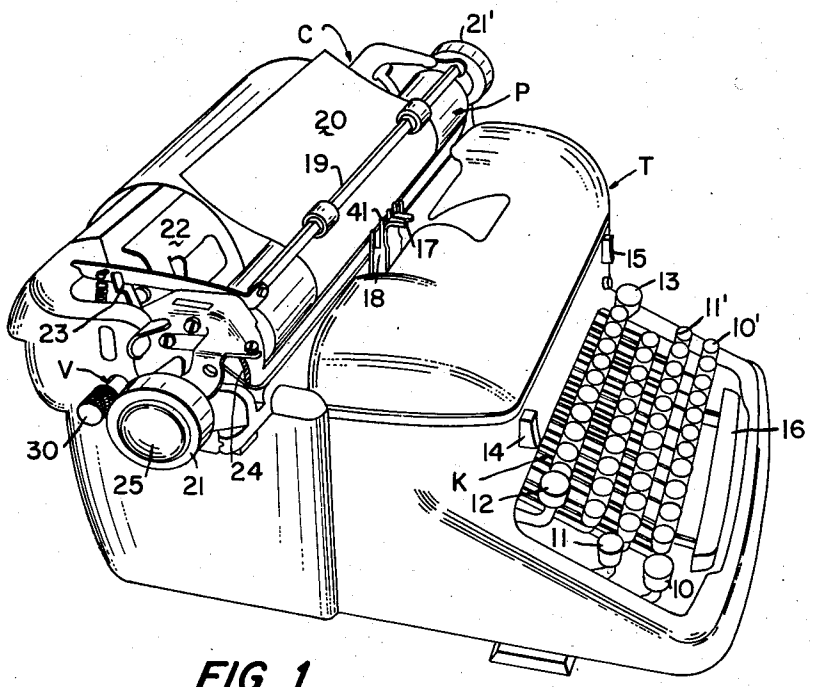

FIG. 1.

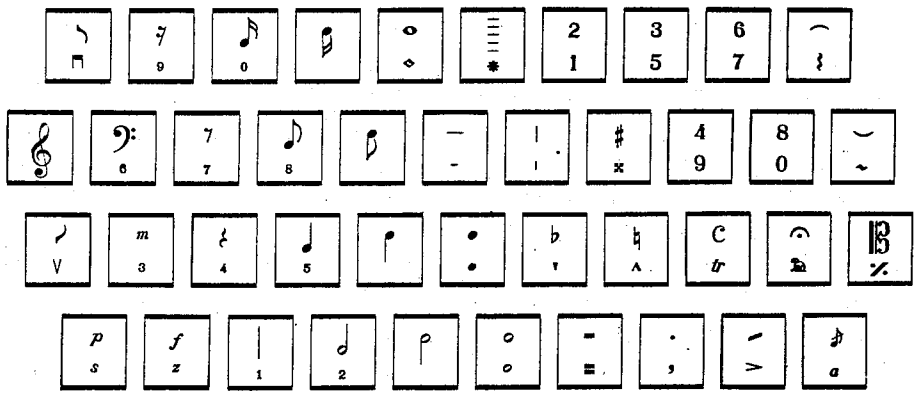

FIG. 2.

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MUSIC TYPEWRITER

Filed June 18, 1956 3 Sheets-Sheet 2

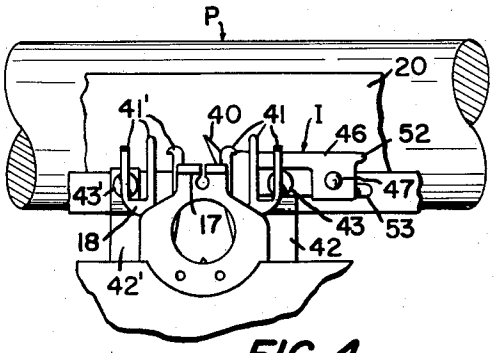

FIG. 4.

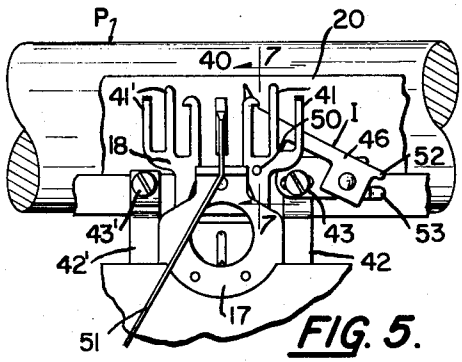

FIG. 5.

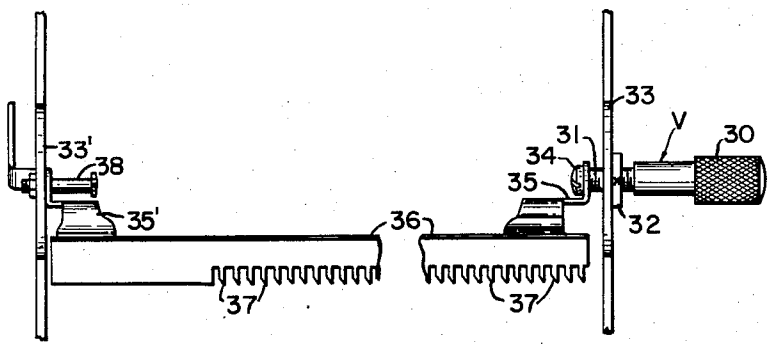

FIG. 3.

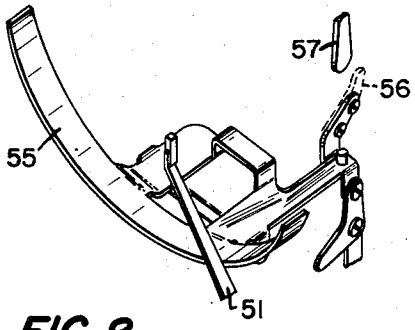

FIG. 8.

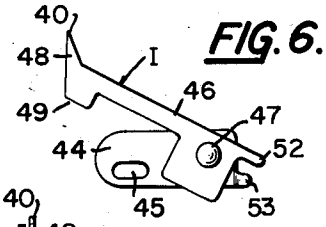

FIG. 6.

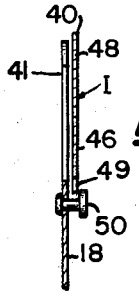

FIG. 7.

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MUSIC TYPEWRITER

Filed June 18, 1956 3 Sheets-Sheet 3

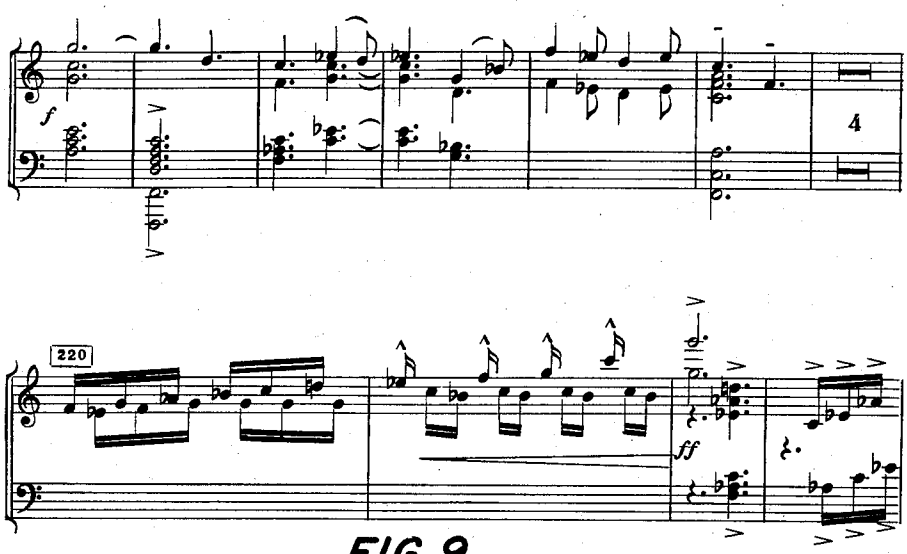

FIG. 9.

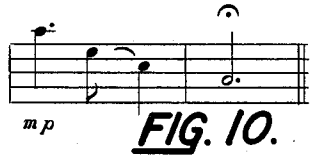

FIG. 10.

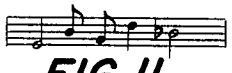

FIG. 11.

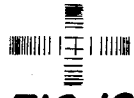

FIG. 12.

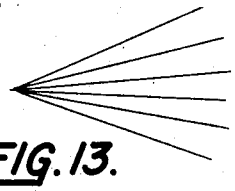

FIG. 13.

FIG. 14.

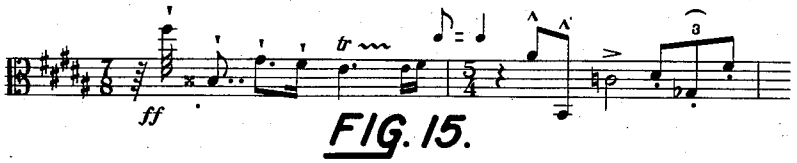

FIG. 15.

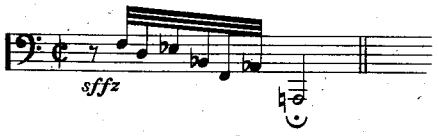

FIG. 16.

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United States Patent Office 2,904,156 Patented Sept. 15, 1959

2,904,156

MUSIC TYPEWRITER

Cecil S. Effinger, Denver, Colo.

Application June 18, 1956, Serial No. 592,053

6 Claims. (Cl. 197—8)

This invention relates to typewriters, and more particularly to typewriters for printing music characters and the like, thus relating to the subject matter of my U.S. Patent 2,672,228, granted March 16, 1954.

As set forth in my aforesaid U.S. Patent 2,672,228, such typewriters are useful not only in composing music, but also in making copies of music for use as such or for reproduction purposes. While there have been numerous attempts to equip a typewriter to print music, such attempts have generally involved undue complications in either structure or use and none prior to my aforesaid patent could be used to produce a properly prepared and natural appearing piece of music, in which the musical characters appear in a flowing pattern of what might be described as "free-hand printing," in which there is no restriction as to placement of the characters, and in which the mind and eye decision of the music typist has full control.

The objects of this invention are similar to those set forth in my aforesaid U.S. Patent No. 2,672,228, and in addition are to provide a music typewriter which is an improvement over the music typewriter of my aforesaid patent accomplishing certain of the desired results in a similar manner but other results by the use of different construction features; to provide a music typewriter which includes a novel printing point indicator which is also useful on typewriters generally; to provide a music typewriter which includes a ratchet mechanism operated by a space bar or the like; and to provide a music typewriter having novel means for placement of the carriage at any desired and precise point for printing.

Additional objects and the novel features of this invention will become apparent from the description which follows, taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of an alphabet typewriter, with changes in certain parts to produce a music typewriter constructed in accordance with this invention;

Fig. 2 is a keyboard diagram, illustrative of one possible combination of keys which may be used in the typewriter of Fig. 1;

Fig. 3 is a condensed top plan view of an escapement bar and certain associated parts, including a vernier which is utilized to adjust the carriage to any intermediate point;

Fig. 4 is an enlarged, fragmentary, front elevation of a portion of the music typewriter of Fig. 1, taken at the printing position and illustrating more particularly a novel printing point indicator;

Fig. 5 is an enlarged fragmentary elevation, similar to Fig. 4, but with the parts thereof in the position assumed when a key is struck and a musical character or the like is being printed;

Fig. 6 is a further enlarged elevation of the principal parts which are added to a normal alphabet typewriter to provide the printing point indicator of Figs. 4 and 5;

Fig. 7 is an enlarged, fragmentary vertical section, taken along line 7—7 of Fig. 5;

Fig. 8 is a fragmentary perspective view of certain parts involved in the escapement mechanism, by which the carriage is advanced automatically one step after a key of a normal alphabet typewriter is struck, illustrating in dotted lines the part which is removed in order to disconnect the keys from the escapement mechanism;

Figs. 9 to 16, inclusive, are photolithographic reproductions of musical printing done entirely on a typewriter constructed in accordance with this invention, as follows:

Fig. 9 is a reproduction of measures 210 to 223, inclusive, of the piano part of the Third Movement of the "Piano Concerto," by Cecil S. Effinger;

Figs. 10 and 11 show different sized staves and illustrative examples of musical character combinations;

Fig. 12 shows parallel lines, both vertical and horizontal;

Fig. 13 shows various slanting lines;

Fig. 14 shows a flowing line of notes; and

Figs. 15 and 16 are reproductions of various musical patterns.

The typewriter T of Fig. 1, constructed in accordance with this invention, is a modification of a commercial alphabet typewriter, i.e., an R. C. Allen Model 714C, and includes a carriage C movable laterally in either direction along ways, a rotatable platen P mounted on the carriage, and a plurality of keys K connected with type bars having musical characters thereon, such as corresponding to those shown in Fig. 2. Conventional left and right shift keys **10** and **10'**, left and right shift locking keys **11** and **11'**, a back space key **12**, a tabulator key **13**, a tab clear key **14**, and a tab set key **15**, may remain thereon. A space bar **16**, when depressed and released, will move the carriage C one space to the left in the conventional manner, but all of the keys K are disconnected from the escapement mechanism, thus actuated only by space bar **16**, as in a manner described later. The typewriter T may also be provided with a type bar guide **17** and a ribbon lift **18**, modified slightly as described later, while the carriage C may be provided with a paper bail **19**, by which a piece of paper **20** is held against platen P, left and right platen knobs **21** and **21'**, a paper guide **22** and a line space platen release lever **23**. When equipped therewith, the half space mechanism is preferably left on the machine. Conventional parts which may be omitted are the carriage return and line space lever, margin set keys, and the ribbon shift lever.

In accordance with this invention, the platen ratchet wheel **24**, which may normally have approximately 32 teeth, is replaced with a ratchet wheel having, say, 132 teeth, so that either platen knob **21** or **21'** may be turned to the next tooth and the surface of the platen P and consequently the paper **20** will move through a distance of 0.034 in. to 0.036 in. or the like, so that movement of the paper will correspond to one-half the vertical line spacing of the staff, such as produced by the sixth key from the left in the upper row. The conventional line space clutch arrangement, actuated by a button **25** mounted in platen knob **21**, may be retained, so that the platen P may be adjusted to any desired point relative to the ratchet wheel.

In further accordance with this invention, a vernier V having an adjustment knob **30** is added to the machine, so that the lateral position of the printing point on the paper **20** may be adjusted to any desired and precise point between the positions produced by the escapement mechanism with which the space bar **16** is connected. In general, the extent of movement provided by the vernier V should be greater than the ratchet single space distance, such as 10% to 20% greater. It will be understood, of course, that by operation of line space release lever **23** or clutch knob **25**, the platen P may be moved

freely by either knob 21 or 21', so that any precise vertical position desired for the printing point may be obtained.

The type bars with which the keys K are connected may have two characters thereon, primarily musical characters, except for certain keys having only one character thereon and which extend sufficiently below the printing position that another character cannot be conveniently placed on the same type bar. While other arrangements of characters and other styles or designs of characters may be utilized, a suitable arrangement may be that shown in Fig. 2, the characters being listed below in accordance with the row in which the key is located and reading from left to right in each row, with those keys having only an upper character indicated thereon being connected with type bars having only one character thereon:

Top row of keys

Upper character:	Lower character:
Flag for stems up	Down bow
16th rest	Small numeral 9
16th note, stem up	Small numeral zero
16th note, stem down	
Whole note	Square note head
Staff liner	Asterisk
Large numeral 2	Large numeral 1
Large numeral 3	Large numeral 5
Large numeral 6	Large numeral 7
Tie	Arpeggio sign

Second row of keys

Upper character:	Lower character:
Treble clef	
Bass clef	Small numeral 6
8th rest	Small numeral 7
8th note, stem up	Small numeral 8
8th note, stem down	
Leger line	Short dash
Fine vertical line	Short vertical line
Sharp	Double sharp
Large numeral 4	Large numeral 9
Large numeral 8	Large numeral zero
Tie	Trill or roll liner

Third row of keys

Upper character:	Lower character:
Flag for stems down	Up bow
Mezzo	Small numeral 3
Quarter rest	Small numeral 4
Quarter note, stem up	Small numeral 5
Quarter note, stem down	Small quarter note head
Quarter note head	Accent
Flat	Accent
Natural	Trill sign
Common time sign	Pedal sign
Hold sign	Measure repeat sign
C-Clef	

Fourth row of keys

Upper character:	Lower character:
Piano	Italic *s*
Forte	Italic *z*
Bar line	Small numeral 1
Half note, stem up	Small numeral 2
Half note, stem down	
Half note head	Small half note head
Horizontal heavy line	Double heavy line
Period	Comma
Slanted heavy line	Accent
Grace note	Italic *a*

As in Fig. 3, the vernier adjustment V may be provided with screw threads 31 at the inner end adapted to engage a nut 32 attached, as by spot welding or brazing, to a carriage end plate 33, the carriage C being mounted on end plates 33 and 33' and being movable along ways, as indicated previously. The inner end of vernier V may be attached for rotation, as by a screw 34, to a bracket 35 which is connected to a rack 36 of the escapement mechanism, rack 36 having teeth 37 and normally being attached by brackets 35 and 35' to the respective carriage end plates 33 and 33'. Also, the usual hole by which bracket 35' is attached, as by a nut and bolt, to end plate 33', instead engages a pin 38, attached to carriage plate 33', so that upon adjustment of vernier knob 30, the carriage C can be moved and pin 38 on end plate 33' will merely slide in bracket 35'. As indicated previously, the length of travel of vernier knob 30 by means of the screw threads 26 is preferably longer than the distance which carriage C is moved by one complete actuation of space bar 16 of Fig. 1.

As indicated in Figs. 4–7, a novel printing point indicator I having an apex or pointer 40 and which is applicable to alphabet and other types of typewriters as well as music typewriters, may be actuated by the ribbon lift 18, which is provided with forks 41 and 41' through which the ribbon is interlaced. A paper guide (not shown since it is preferably removed) may normally be attached, as by screws 43 and 43', to bracket arms 42 and 42', respectively, while screw 43 may be utilized to mount indicator I on bracket arm 42 and screw 43' may be left in place for the sake of appearance. Printing point indicator I, as in Fig. 6, may include a plate 44 having a slot 45 therein, through which screw 43 of Figs. 4 and 5 extends, and an arm 46 pivotally mounted on plate 44, as by a rivet 47 and normally resting on screw 43, as in Fig. 4, to position apex 40 at exactly the printing point, normally the center of the character, or the center of the head of a sixteenth, eighth, quarter or half note with stem. At its inner end, arm 46 is provided with an inwardly and upwardly extending triangular segment 48, which terminates in apex 40, and a downwardly extending abutment 49 adapted to be engaged by button 50, conveniently attached to ribbon lift 18, as in Fig. 7, so that when the ribbon lift 18 is elevated, when a key K of Fig. 1 is struck and a type bar 51 comes up, as in Fig. 5, button 50 will push arm 46 upwardly to cause the arm to clear the printing area. When the ribbon lift 18 is retracted, the arm 46 will fall back to the position of Fig. 4, but to prevent arm 46 from being thrown to or past a vertical position, from which it might not fall back readily, the outer end of arm 46, as in Fig. 4, may be provided with a longitudinally extending ear 52 and the lower outer corner of plate 44 provided with an ear 53 which is bent angularly to extend outwardly from the plane of Fig. 6, so as to engage ear 52 in the event that arm 46 moves upwardly past the position of Fig. 5. Thus, arm 46 can move only until ear 52 engages ear 53, but will still be in a position to fall back readily to the position of Fig. 4.

As illustrated in Fig. 8, it is necessary to remove only one part to disconnect the keys from the escapement mechanism, for the conversion to a music typewriter of the typewriter indicated previously. Normally, when a key is struck, a type bar 51 will engage the upper universal bar frame assembly 55 to cause the escapement trip plate 56 to engage the lower end of escapement trip lever 57, thereby causing the escapement mechanism to shift carriage C one space to the left when the type bar 51 moves back after printing. However, by removing trip plate 56 shown in dotted lines in Fig. 8, the escapement trip lever 57 will not be engaged, so that the escapement mechanism will not be operated when a key is struck. It will be understood that one or more parts having the same function in other types of alphabet typewriters, may be removed or altered for the same purpose, or other suitable means to effect "dead key" operation may be used.

As indicated previously, the connection between the space bar 16 of Fig. 1 and the escapement mechanism, by which the carriage C may be shifted one space to the

left each time the space bar **16** is depressed, may be retained in the typewriter, although the keys K are disconnected from the escapement mechanism, as in the manner described. The spring which normally pulls the carriage to the left may also be retained, in order to permit the spacing of the carriage by use of the space bar to be accomplished in the conventional manner. However, the carriage C is movable to and retainable at any desired position through use of the space bar **16** and the vernier V, which permits adjustment of the carriage to any precise point intermediate adjacent positions produced by the carriage shifting means, actuated by the space bar. When the half spacing mechanism is left on the machine, when space bar **16** is pressed down, the carriage will be moved one-half space, and when space bar **16** is released, the carriage will be moved another one-half space, to complete the movement of the carriage for a full space. Thus, if a half space is desired, the space bar **16** may be depressed and held down while the key is struck, or the vernier V adjusted to move the carriage to the precise printing point desired, if not exactly at the half space position, after which the key is struck. Furthermore, the platen P is also movable to and retainable at any desired position normally vertically of the paper, either through the knobs **21** or **21'** and the ratchet wheel **24** which, as indicated previously, is provided with relatively fine teeth so that the platen may be moved by knobs **21** or **21'** to spaced vertical positions on the paper corresponding to one-half of the staff line spacing; or the line space release lever **23** may be operated so that the knob **21** or **21'** and therefore the platen P may be freely turned, in the event that the desired printing point is somewhere between two of the positions produced by ratchet wheel **24**. As will be evident, since the apex **40** of the printing point, indicator I is located at precisely the common printing point, such as the center of the musical character, or the head of a note, the typist always knows the exact position thereof. In use of the typewriter of this invention, one hand, such as the left hand, may be used to shift the platen P so that the precise vertical position of the printing point is obtained, while if the position of the musical character to be printed is not precisely located longitudinally by use of the space bar **16**, the vernier knob **30** may be turned to adjust such lateral position on the paper. Thus, music such as shown in Figs. 9, 15 and 16 may be printed or reproduced with the placement, flexibility and precision required for best legibility. When a series of notes having their heads in vertical alignment are to be printed, the carriage is moved to the precise lateral position desired, while the platen P is then adjusted to the respective vertical positions for printing the desired music characters. Due to the ease and simplicity with which the carriage and platen may be moved to and retained at the desired printing point, the writing or reproduction of music proceeds smoothly, since only a small amount of practice is necessary for the user to become accustomed to the vertical adjustments of the platen P and the lesser number of lateral adjustments of the carriage C by the vernier V. The staves may be preprinted on the paper being used, or may be printed on the paper by striking the staff key (fifth from the right in the top row of Fig. 2) alternately with the space bar **16**. Also, various patterns of lines and notes may be printed, such as the combination of ledger lines and bar lines at varying distances apart in Fig. 12 or the flowing line of notes of Fig. 14, through observation of the apex **40** of the printing point indicator and movement of the platen P, accompanied where necessary by slight adjustment of the vernier V. The slanting lines of Fig. 13 may be produced by shifting the paper in the machine to the desired angle, it being noted that the indicator I enables the paper to be returned to any desired printing point with ease and accuracy. In the event that the staffs preprinted on the paper are larger, as in Fig. 10, or smaller, as in Fig. 11, than the staff lines printed by the staff key, each note and music symbol may be located in position and printed with the same ease. In general, the necessity for critical vertical positioning is much more than the necessity for critical lateral positioning, so that the vernier V need not be adjusted nearly as often as the platen P, as the space bar **16** will normally provide, especially with the use of the half-space function, most of the lateral spacing requirements. In addition, the design of the characters may be correlated with the spacing provided by space bar **16**, i.e., either full or half spaces, to take functional advantage thereof. For instance, the width of the note heads, such as on the type bars corresponding to the sixth key from the left in the third row and the fourth row of Fig. 2, may be chosen so as to be equal to one full lateral space, so that when a stem is added to the note head, a frequently required function, the use of a half space will automatically cause the fine vertical line of the stem to be printed in the desired position.

From the foregoing, it will be evident that a music typewriter constructed in accordance with this invention fulfills to a marked degree the requirements and objects hereinbefore set forth. It will also be evident that variations in the construction of the typewriter of this invention may be used, such as different arrangements of keys, other ways in which the keys may be disconnected from the carriage spacing mechanism, other ways of connecting the vernier adjustment to the carriage, different shapes and constructions of the printing point indicator, as well as others. Thus, it will be evident that additional embodiments may exist and various changes may be made therein, all without departing from the spirit and scope of this invention.

What is claimed is:

1. In a typewriter for printing music characters on paper or the like, a series of type bars having music characters thereon; a series of activating keys associated with said type bars for moving individual type bars to printing position; a carriage; a platen mounted on said carriage and movable to and retainable at any desired position; a pointer for indicating the printing point; means for shifting said carriage in lateral increments of a predetermined distance, said means being independent of the action of said keys; and adjusting means independent of said carriage shifting means, for moving said carriage to any desired point between adjacent positions produced by said carriage shifting means, whereby said carriage is movable to and retainable at any desired lateral position.

2. In a typewriter for printing music characters on paper or the like, as defined in claim 1, wherein said carriage adjusting means includes a vernier adjustment device.

3. In a typewriter for printing music characters on paper or the like, as defined in claim 1, wherein one of said music characters is adapted to print a music staff; and said platen is provided with a ratchet wheel having a series of closely spaced teeth corresponding to one half the distance between the lines of said staff.

4. In a typewriter for printing music characters on paper or the like, as defined in claim 1, wherein said carriage includes spaced end plates and said carriage shifting means includes a member extending longitudinally relative to said carriage; and wherein said adjustment means includes a sliding pin connection between said longitudinal member and one said end plate, and a knob rotatably attached at its inner end to said longitudinal member and provided with threads engaging a threaded portion of the opposite end plate, said knob extending from said carriage at one end thereof and adjacent the corresponding end of said platen.

5. In a typewriter for printing music characters on paper or the like, a series of type bars having music characters thereon, one of said type bars being adapted to print a music staff; a series of activating keys associated with said type bars for moving individual type bars to printing position; a carriage movable to and retain-

able at any desired position; a platen mounted on said carriage and movable to and retainable at any desired position, said platen being provided with a ratchet wheel having a series of closely spaced teeth corresponding to one half the distance between the lines of said staff; means including a space bar adjacent said keys for shifting said carriage in increments of a predetermined distance, said means being independent of the action of said keys; vernier adjusting means connected with said carriage and independent of said carriage shifting means, for moving said carriage to any desired point between adjacent positions produced by said carriage shifting means; a ribbon lift for maintaining a ribbon in a position normally spaced from the point at which a type bar will print and moving said ribbon to a position for engagement with a type bar at the printing point when the key corresponding thereto is struck; a printing point indicator; a support for said indicator adjacent said ribbon lift, said indicator being pivotally mounted on said support; and means associated with said ribbon lift for moving said indicator away from the printing point upon movement of said ribbon lift to said printing point positon of said ribbon.

6. In a typewriter having a series of type bars and actuating keys therefor, and a ribbon lift for maintaining a ribbon in a position normally spaced from the point at which a type bar will print and moving said ribbon to a position for engagement with a type bar at the printing point when the key corresponding thereto is struck, the improvement comprising a printing point indicator support adjacent said ribbon lift; a printing point indicator including a plate having a slot adjacent the inner end thereof and engageable by a screw or the like for attachment to said support adjacent said ribbon lift, said plate having an outwardly extending ear at the lower outer corner thereof; an arm pivotally connected to said plate intermediate said slot and ear and having a triangular segment at the upper inner corner whose apex is adapted to indicate the printing point, an abutment below said segment and an outwardly extending projection at the outer end engageable with said ear upon pivotal movement of said arm to a position less than vertical, said arm being adapted to engage said attachment screw to position said apex at the printing point; and a button attached to said ribbon lift in a position to engage said arm abutment, to move said arm away from the printing point as said ribbon lift rises, said ribbon lift having a lower normal position and moving upwardly to printing position.

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