

1,391,788.

Patented Sept. 27, 1921.

4 SHEETS—SHEET 1.

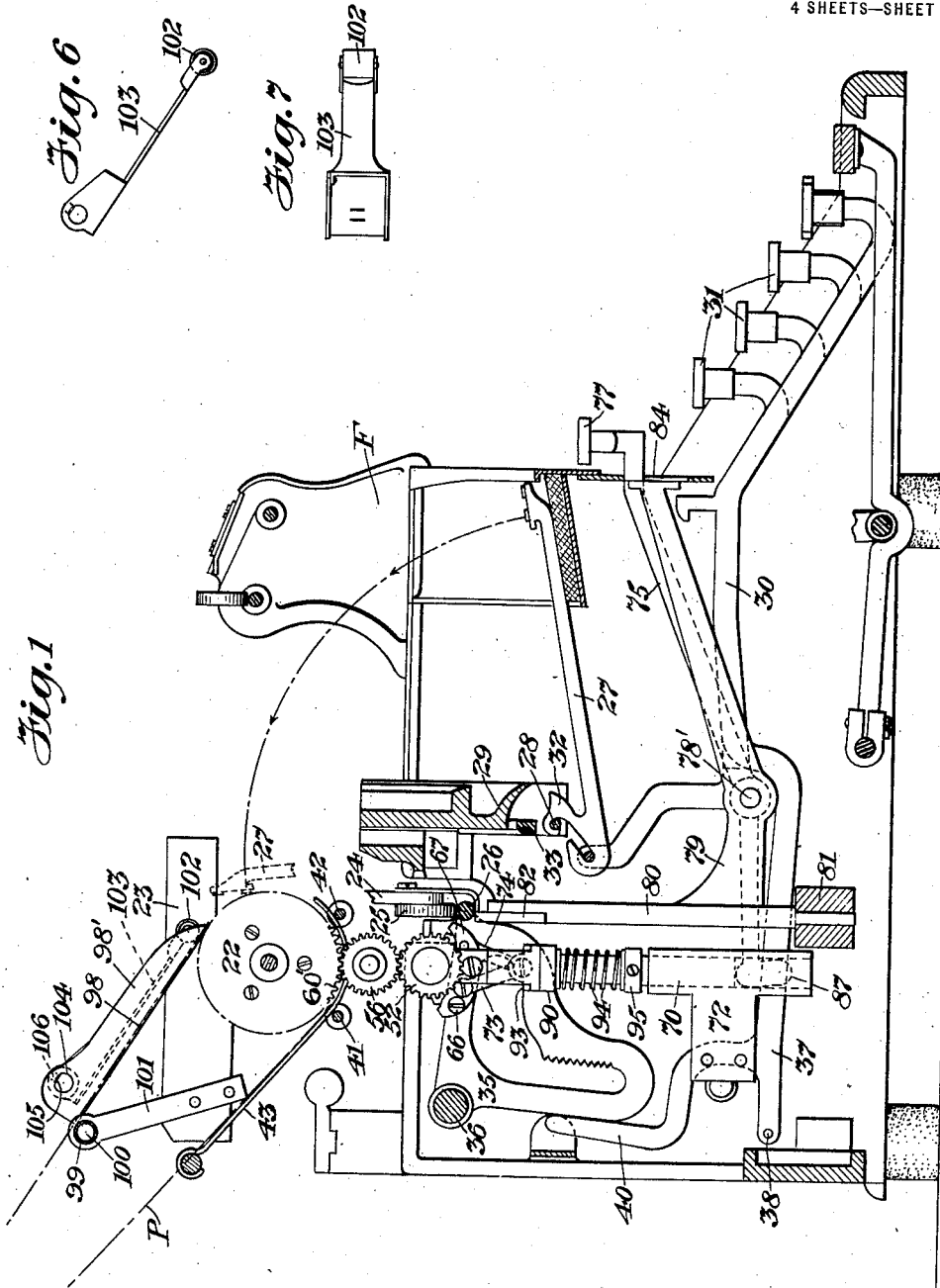


Fig. 1

Fig. 6

Fig. 7

WITNESSES
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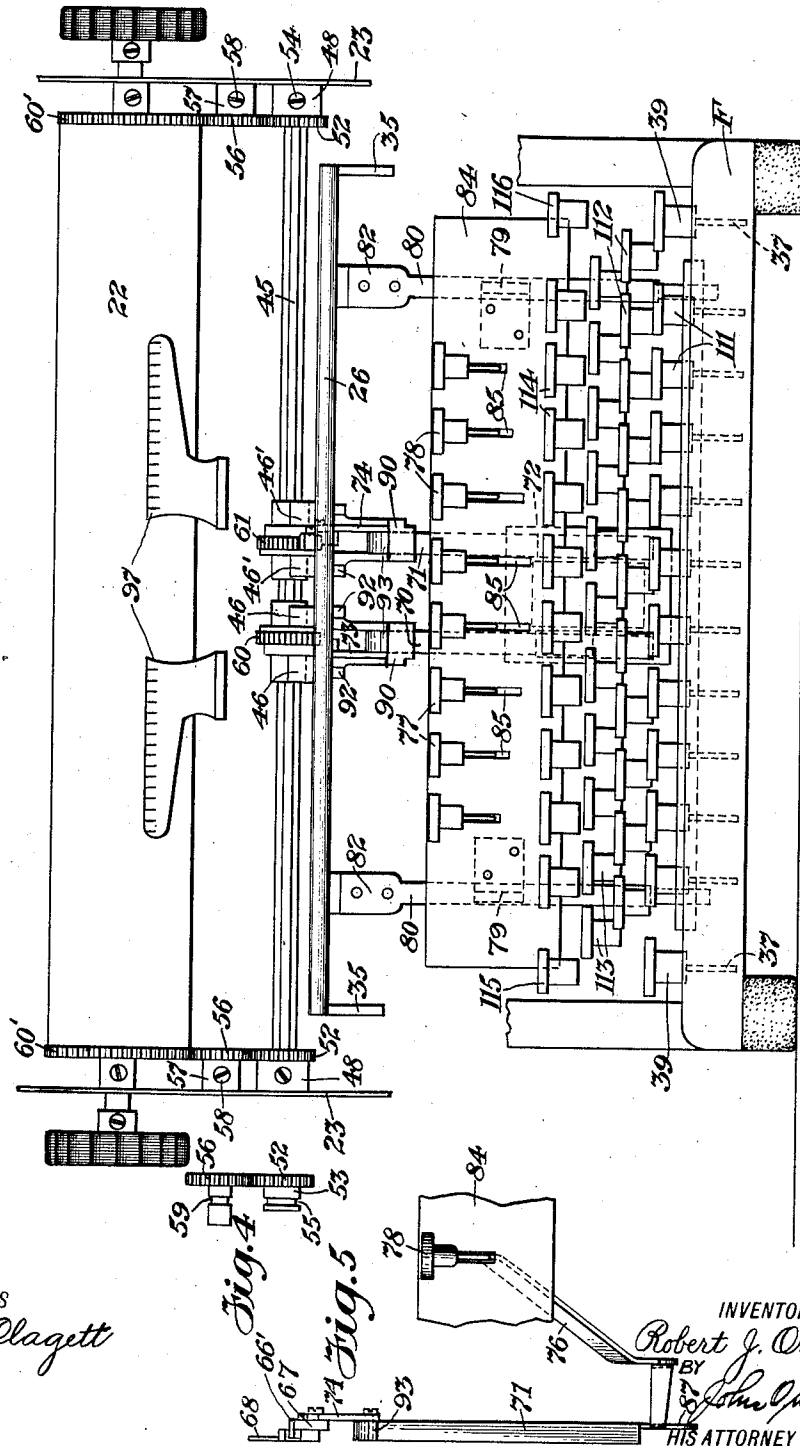
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4 SHEETS—SHEET 2.

Fig. 3



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Fig. 4

Fig. 5

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R. J. ORR.
 WRITING MACHINE.
 APPLICATION FILED SEPT. 23, 1918.

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 4 SHEETS—SHEET 3.

Fig. 21

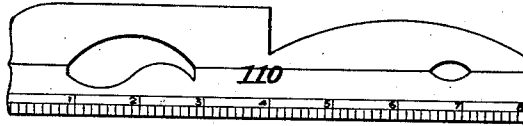
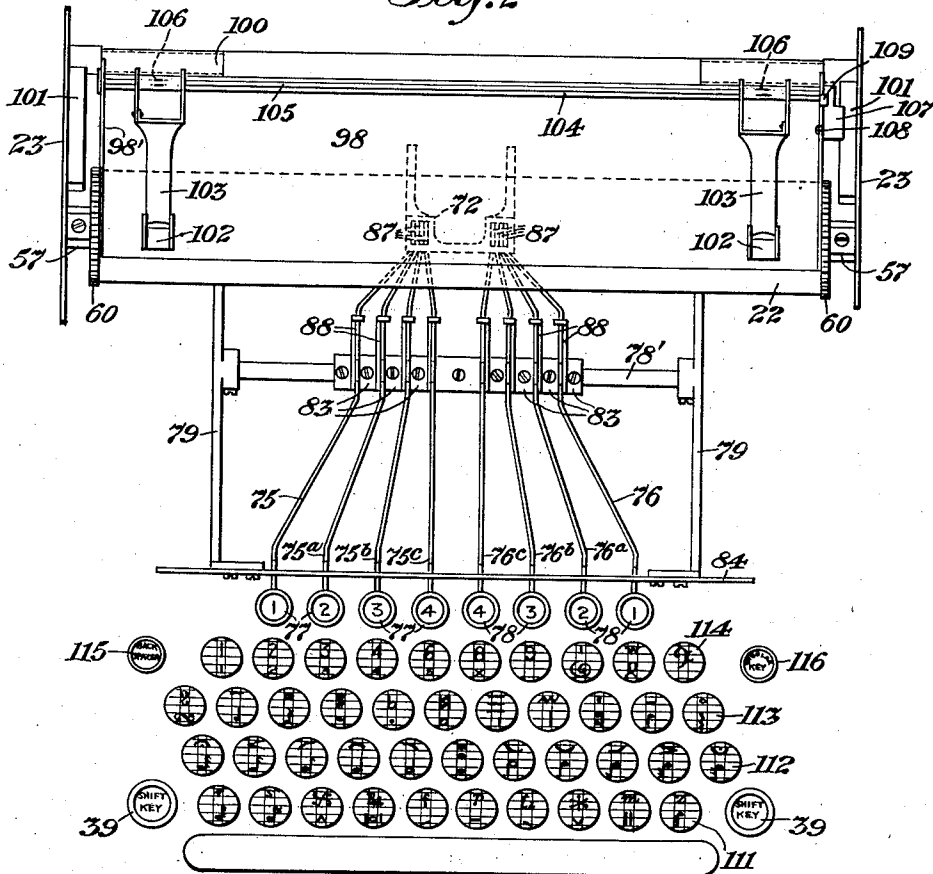


Fig. 2



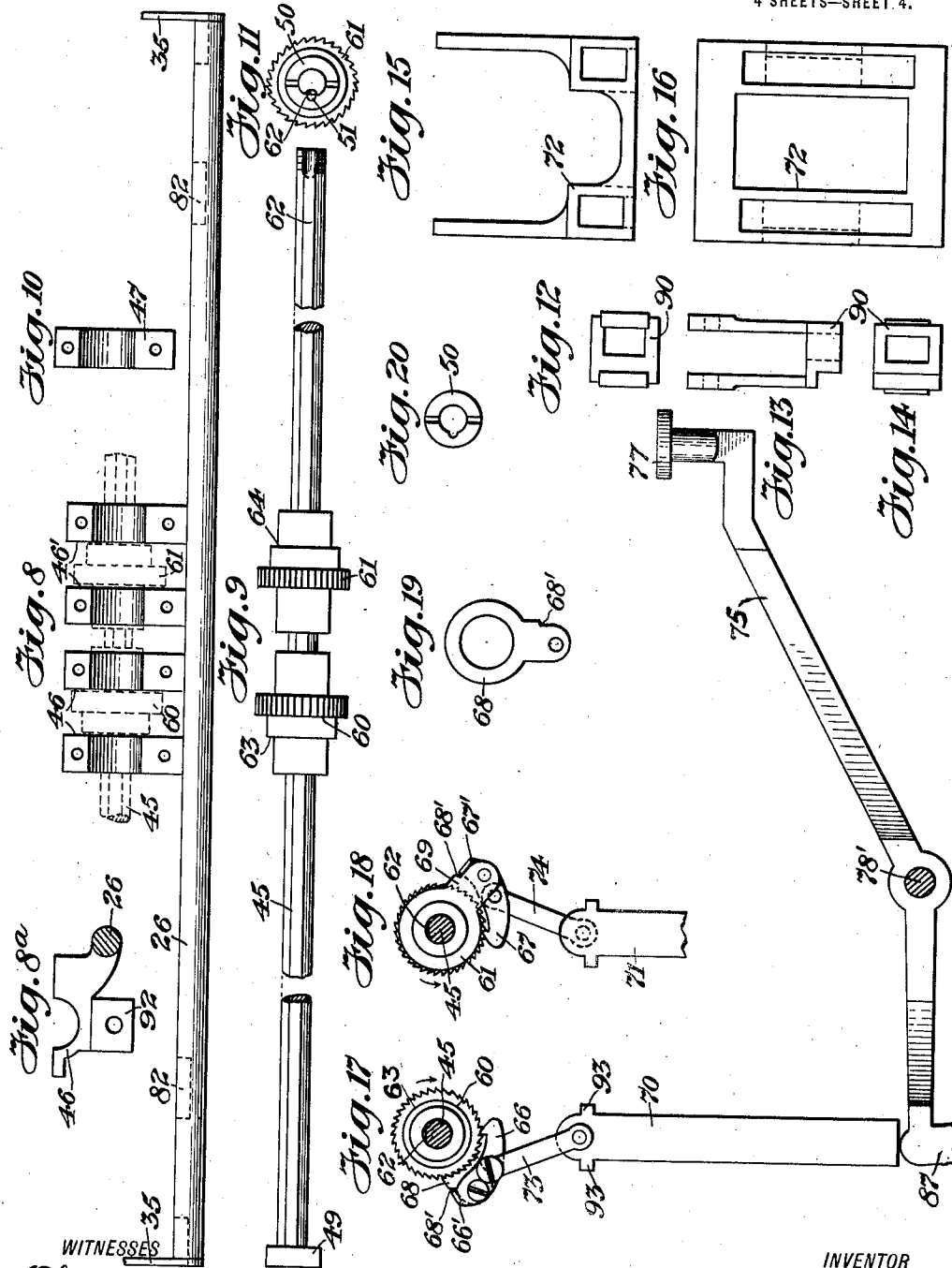
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ROBERT J. ORR, OF BROOKLYN, NEW YORK.

WRITING-MACHINE.

1,391,788.

Specification of Letters Patent. Patented Sept. 27, 1921.

Application filed September 23, 1918. Serial No. 255,326.

To all whom it may concern:

Be it known that I, ROBERT J. ORR, a citizen of the United States, residing in the borough of Brooklyn, in the county of Kings, city and State of New York, have invented new and useful Improvements in Writing-Machines, of which the following is a specification.

This invention relates to writing machines, and particularly to machines for writing musical notations, and it is the object of the invention to provide a writing machine of this character whereby it is possible to write or print not only the notes or characters representative of different tones, but also all of such signs as are commonly used in the different parts of musical composition.

It is a further object of the invention to provide in a machine of this character a platen to carry the paper upon which the music characters and signs are to be impressed, said platen being mounted in a carriage to have to and fro longitudinal movement with the necessary mechanism to advance the carriage with the platen step by step letter space distances in the usual manner in typewriting machines, and to adjust or line space the platen at will either forwardly or backwardly predetermined distances equivalent to one or more degrees of the music staff within a single octave or a multiple of octaves to collect and properly arrange the different parts of a musical composition in the form of a score.

It is another object of the invention to provide in a writing machine of the present commercial type of machine mechanism to line space a platen at will either forwardly or backwardly distances representative of one or more degrees, or multiples thereof, of a music staff, and to substitute for the characters of the impression making devices representative of written speech characters representative of musical notation.

It is a further object of the invention to provide in a machine of this character a paper shelf or table to extend longitudinally of and above the writing line of the platen, and means to hold the paper firmly in contact with such shelf to facilitate the

manual writing of musical signs in connection with the mechanically written music characters when sweeping lines are desired, such as braces, and slurs or lines representative of expression as crescendo, diminuendo, &c.

It is a still further object of the invention to provide a templet for use in connection with the paper shelf for the manual writing of lines of expression, such as slurs or the like, and other musical signs, in connection with the mechanically written characters.

It is a further object of the invention to provide an improved lay out for a keyboard for machines for writing musical composition so arranged as to be adapted for writing machines in which the impression making devices carry two characters or portions of different characters adapted to be compounded or built up in writing a single music character, and to show the relation of the music characters to the music staff to guide the operator and facilitate operation.

Other objects and advantages will herein-after appear.

While the present invention relates particularly to a machine adapted for the writing of musical composition the invention is applicable to any of the well known commercial typewriting machines utilized for the production of written speech by substituting for the characters representative of written speech impression making devices or characters representative of written music, and as an illustration of an embodiment of the invention the invention has been shown in connection with a typewriting machine of the well known Underwood make, only so much of the mechanism of such machine being shown as is essential to an understanding of the invention.

In the drawings accompanying and forming a part of this specification, Figure 1 is a sectional side elevation of my invention applied to the Underwood typewriting machine and showing only such parts of said machine as are essential to an understanding of the invention.

Fig. 2 is a plan view to illustrate the lay

out of the improved key-board, the lever mechanism with the connected keys to actuate the platen advancing and retracting means and the relation of the improved paper shelf to the platen.

Fig. 3 is a view looking at the front of Fig. 1 with the paper shelf removed.

Fig. 4 is a detail front elevation of gearing to connect the platen advancing and retracting means to the platen.

Fig. 5 is a front elevation showing the lever actuated means for operating the platen actuating means and one of the key levers for actuating the same.

Fig. 6 is a side elevation and Fig. 7 is a plan view of a paper roller carrying finger used in connection with the paper shelf.

Fig. 8 is a detail plan view of the platen supporting and shifting rail of the Underwood typewriting machine showing the means connected thereto to rotatably support a shaft forming a part of the platen advancing and retracting means.

Fig. 8^a is a side elevation of a shaft hanger connected to the shift rail.

Fig. 9 is a side elevation of a shaft carried by the platen shifting rail shown in Fig. 8, with toothed wheels carried thereby and forming a part of the platen advancing and retracting means.

Fig. 10 is a bottom view of a pillow block for securing the shaft shown in Fig. 9 in its support carried by the platen shift rail.

Fig. 11 is a view looking at the right of Fig. 9.

Figs. 12, 13 and 14 are top, front and bottom views, respectively, of means for supporting a part of the platen advancing and retracting means from the platen shift rail.

Fig. 15 is a plan view and Fig. 16 a front elevation of a bracket for supporting a portion of the platen advancing and retracting means.

Fig. 17 is a detail view in side elevation of ratchet mechanism to cooperate with one of the toothed wheels on the shaft shown in Fig. 9 and the connected means to actuate the same and a lever for actuating said means to move the platen in one direction.

Fig. 18 is a side elevation of means similar to that shown in Fig. 17 arranged to cooperate with the other toothed wheel mounted on the shaft shown in Fig. 9 and operable by a lever or levers to move the platen in a direction opposite to the movement imparted thereto by the means shown in Fig. 17.

Fig. 19 is a side elevation of a ring to support the ratchets shown in Figs. 17 and 18 from the shaft shown in Fig. 9.

Fig. 20 is a detail of a collar to be removably connected to the right hand end of the shaft shown in Fig. 9; and

Fig. 21 is a plan view of the templet to be used in connection with the paper shelf

for manually producing music signs in connection with the mechanically written notations.

Similar characters of reference designate like parts throughout the different views of the drawings.

As stated the invention is shown in connection with the well known Underwood typewriting machine, the framework of which machine is shown in a general way at F. A platen 22 is rotatably mounted by an axle in a platen frame 23 supported by a carriage (not shown) to have longitudinal to and fro movement, said platen carrying frame at the forward end, as shown at 24, being supported by a roller 25 upon a rail 26. Type carrying bars 27 to strike rearwardly against the front of the platen, as shown in dotted lines in Fig. 1, are fulcrumed upon a wire 28 in slots of a segment 29, and are actuated by levers 30 carrying at their forward upturned ends finger keys 31. A heel 32 on the typebars as they are moved to printing position engages with and moves a universal bar 33, said bar forming a part of and actuating feeding devices (not shown) to advance the platen carriage step by step in letter space direction upon the actuation of the typebars. The typebars each carry two impression making characters, and to position the platen so that the writing line of the platen is in position to receive either of said characters the platen frame is arranged to be capable of assuming an upper and lower position. For this purpose the rail 26 supporting the front portion of the platen frame is fixed at opposite ends to a pair of carriers 35 secured to a rod 36 fulcrumed at its ends in the machine frame F. To move the carrier 35 and thereby shift the rail with the platen to the upper position there are provided two levers 37 the actuation of either one of which levers operates to raise the rail with the carriage. The levers are fulcrumed as at 38 and extend to the front of the key-board and have finger keys 39 at said ends with designations representative of said levers. (Figs. 2 and 3). The rear end of each lever has an arm 40 to engage the rear of the carriers 35 below the carrier supporting rod 36. As the finger key end of said levers is depressed the lever arms 40 are moved forward and the carriers 35 moved to raise or lift the rail and thereby the platen to its upper position. Means are provided to retain the platen shifting mechanism in position with the platen in its upper position, but as such mechanism is well known a detail description and illustration of the same is not deemed necessary.

The paper, shown in a general way at P, to receive the impressions upon the platen from the impression making devices is guided between feed rollers 41, 42 and the

platen and around the platen by a table 43 extending between the ends of the platen frame.

The foregoing description is of mechanism which is common in the Underwood typewriting machine, and while the invention is illustrated and will be described in connection with this type of writing machine in which the platen is adapted to assume two different positions, an upper and a lower position, and normally maintained in the lower position, it is to be understood that my invention is applicable to machines in which the platen is shiftable to two or more positions or in which the impression making devices are shiftable and the platen retained in a fixed position.

As stated it is an object of the invention to line space the platen either forwardly or backwardly predetermined distances representative or equivalent of one or more degrees or diatonic sounds above or below the initial note, and in order to meet the requirement of modern musical composition the mechanism is adapted to adjust or line space the platen either forwardly or backwardly a single or a multiple of degrees within a single octave or a multiple of octaves thereby enabling the operator to collect and properly arrange the different parts of a musical composition.

To line space the platen forwardly or backwardly a single or a multiple of diatonic sounds or degrees to raise or lower the tone there is provided a shaft 45 rotatably supported in two pairs of hangers 46, 46' fixed to the platen shift rail 26 to extend rearwardly therefrom, and the shaft retained in said hangers by blocks 47 to engage over the wheel hubs and releasably connected to the hangers as by screws passing through perforations in said blocks and threaded into the hangers. The shaft is also journaled at its ends in bearings 48 (Fig. 3) secured in the platen frame ends. To rotatably support the shaft in said bearings one end has an integral head 49, and a head 50 in the form of a collar (Fig. 20) is removably secured to the opposite end of the shaft as by screw threading thereto, and locked thereto by a set screw 51 (Fig. 11) threaded into portions of the collar and the shaft.

The shaft 45 is geared to the platen by gears 52 mounted at opposite ends of the shaft to rotate therewith, and each gear having a hub portion 53 whereby they are journaled in the bearings 48 with the ends of the hubs abutting against the inner sides of the heads 49, 50 of the shaft 45. The gears are retained in the bearings by set screws 54 threaded into and passing through the gear bearings and engaging in annular grooves 55 in the gear hubs (Fig. 4) for a purpose to be hereinafter described. The

gears 52 mesh with pinions 56 having a hub whereby they are journaled in bearings 57 secured in the platen frame ends and held against axial movement by set screws 58 threaded in and passing through said bearings to engage in annular grooves 59 in the pinion hubs. (Fig. 4). The pinions 56 mesh with teeth formed on heads 60' secured to the ends of the platen.

A pair of toothed or ratchet wheels 60, 61 are mounted on the shaft 45, said wheels having hubs extending from opposite ends and whereby the shaft 45 is journaled in the hangers 46, 46'. The shaft 45 is adapted to participate in the longitudinal to and fro movement of the platen carriage. However, the wheels 60, 61 do not participate in this movement but are mounted on the shaft to rotate therewith. For this purpose the shaft has a flat portion 62, and the bore of the ratchet wheels is shaped to correspond with the cross sectional shape of the shaft. To prevent longitudinal movement of the ratchet wheels with the shaft the hangers 46, 46' are so arranged that one of the hangers 46 will abut against one side of the ratchet wheel 60 and the other hanger 46 will abut against a shoulder 63 formed on the wheel hub. Similarly the wheel 61 is prevented from participating in the longitudinal movement of the shaft 45 by one of the hangers 46' abutting against one side of the ratchet wheel 61 and the other hanger 46' abutting against a shoulder 64 formed on the hub of said wheel.

To advance or line space the platen forwardly the ratchet wheel 61 is rotated upwardly as viewed in Fig. 3 or in the direction of the arrow shown in Fig. 18, and to retract or line space the platen backwardly the ratchet wheel 60 is rotated downwardly as viewed in Fig. 3 or in the direction of the arrow shown in Fig. 17. To rotate said wheels 60, 61 a pair of ratchets or pawls 66, 67 are pivotally carried by extensions of rings or collars 68, 69 (Fig. 19) carried loosely on the enlarged portions of the hubs of the wheels 60, 61 and located in the spaces between the respective pairs of hangers 46, 46'. The ratchets have pallets to engage the teeth of the ratchet wheels and the ratchets are so arranged, as shown in Figs. 17 and 18, that as movement is imparted to the ratchet 66 it will move the wheel 60 in a direction to retract the platen, and as movement is imparted to the ratchet 67 it will move the wheel 61 in a direction to advance the platen. The ratchets 66, 67 are actuated through slides 70, 71 mounted in a bracket 72 (Figs. 15 and 16) secured to the framework of the machine to permit said slides to have longitudinal vertical movement, and the slides are connected to the respective ratchets by links 73, 74. It will be obvious that as the slides are moved upward the ratchets will

be thrown into engagement with the teeth of the ratchet wheels and moved upward to impart movement to said wheels, this upward movement of the ratchets being permissible due to the loose connection of the rings 68 on the hubs of the wheels, and that this movement of the ratchet wheels will be varied in accordance with the upward movement of the slides. As the slides are returned, and thereby the ratchets, laterally bent lugs 66', 67' of the ratchets will engage with a beveled portion 68' of the extensions of the rings 68 to which the ratchets are connected and cause said rings with the ratchets to move to initial position.

As stated the platen is adapted to be advanced or retracted predetermined distances or degrees equal to a single diatonic sound, or a multiple thereof, represented by the ledger lines and spaces of the music staff. For actuating the ratchets to advance or retract the platen such predetermined distances selective means are provided, comprising two sets of levers, one set of levers (Figs. 1, 2, 3 and 5) 75, 75^a, 75^b and 75^c being adapted to raise or lift the slide 70 variable distances to actuate the ratchet 66 to rotate the wheel 60 to retract the platen predetermined distances, and the other set of levers 76, 76^a, 76^b and 76^c being adapted to raise or lift the slide 71 variable distances to actuate the ratchet 67 to rotate the wheel 51 to advance the platen predetermined distances. Each of the levers 75, 75^a, 75^b and 75^c has a finger key 77 connected thereto with the numeral characters 1, 2, 3 and 4 reading from left to right (Fig. 2) and indicative of the degree of retraction of the platen upon the actuation of the respective levers; while each of the levers 76, 76^a, 76^b and 76^c has a finger key 78 with the numeral characters 1, 2, 3 and 4 reading from the right to the left and indicative of the degree of advance of the platen upon the actuation of such levers.

The slide actuating levers are fulcrumed between their ends upon a rod 78' fixed at its ends in arms 79 extending forward from vertical posts 80 having shouldered lower ends whereby they are slidably mounted in a cross-bar 81 of the framework and secured at their upper ends to ears 82 depending from the shift rail 26 for a purpose to be hereinafter described. The levers are maintained in spaced relation upon the rod 78' by collars 83. The forward ends of the levers carrying the finger keys extend through gage slots 85 in a transverse plate 84 secured to the forward ends of the arms 79. These slots 85 are of varying length to regulate the depression of the respective finger key ends of the respective levers and thereby control the raising or lifting of the slides 70, 71 and the movement imparted to the ratchets 66, 67. The rear ends of the

levers are of hammer head shape, as shown at 87, (Figs. 1, 5 and 17,) with the depending portion elongated and the upper edge engaging with the bottom of the slides rounded and arranged so that they normally engage with the bottom of the slides slightly in the rear of the longitudinal center of the slides, but as the levers are actuated the hammer head of the levers moves to a position forward of the longitudinal center of the slides thereby equalizing the shift of the hammer head. Springs 88 mounted on the rod 78' operate to return the levers. The elongated lower ends of the hammer heads serve as guides to maintain the levers in proper position in the bracket in relation to the slides.

The upper ends of the slides 70, 71 slidably engage in and are guided in openings in guides 90 in the form of a yoke member, said guides being secured by the arms of the yoke to depending lugs 92 of the hangers 46, 46' for the shaft 45, each arm of one guide yoke being secured to a lug 92 depending from each of the hangers 46, and each arm of the other guide yoke being secured to a lug 92 depending from each of the other hangers 46'. The slides 70, 71 have opposite laterally extending projections 93 to engage over the connecting portion of the guide yokes to limit the downward movement of the slides, and for a further purpose to be hereinafter set forth. The slides are returned to initial position by light springs 94 coiled about the slides and confined between collars 95 secured to the slides and the connecting portion of the yoke guides 90.

To adapt the platen advancing and retracting devices as above described to a writing machine in which the platen is arranged to assume two positions, an upper position and a lower position, as by shifting the platen frame by the shift rail 26 as hereinbefore described, and maintain the platen advancing and retracting means in operative relation with the platen the posts 80 carrying the lever supporting rod carrying-arms 79 and thereby the levers are connected to the depending ears 82 of the shift rail whereby as the rail is raised or lowered the lever mechanism will be moved therewith. It will also be obvious that as the shaft 45 carrying the ratchet wheels and actuating means therefor is carried by the shift rail such mechanism will also be shifted with the rail, and the slides 70, 71 will also be shifted therewith by the engagement of the projections 93 thereof with the guide yokes 90. It will thus be seen that as the shift rail is moved to what is commonly termed the "upper case" position the lever mechanism, slides and the platen advancing and retracting means actuated by the slides are lifted therewith as a unit, and as the

rail is again lowered such mechanism will be lowered with the rail as a unit.

In operation the blank music paper ruled with the usual staff is guided between the feed rollers 41, 42 and around the platen by the table 43 and alined with the first line of the staff with the writing line of the platen by the usual platen scale 97, shown as the pivoted wing scale used in the Underwood typewriting machine, when the platen carriage is moved to position to begin the line of writing. The treble clef or base clef, as desired, is then written by striking the proper key or keys of the impression making devices actuating levers, after which the signatures of key and time are printed by actuating the proper key levers for such characters when the writing of the composition or the notation is proceeded with. It is to be understood that during the writing of the foregoing as the impression making devices are actuated the carriage feeding devices are operated to advance the carriage step by step letter space distances. Should it be desired to raise or lower the tone of a succeeding note one degree the lever actuating the platen advancing or retracting means carrying the numeral character "1" is depressed and the proper music notation printed or written. Should it be desired to raise or lower the tone of the succeeding note two, three or four degrees, or multiples thereof, either of the levers carrying the numeral characters "2," "3" or "4" is depressed which will advance or retract the platen two, three or four degrees when the music notation is printed, and so on until the music score has been composed or compiled.

To facilitate the manual writing of music signs in connection with the mechanically written characters or music notations, a paper shelf or table 98 is provided to extend along and above the platen, said shelf inclined downward and forward toward the platen with the leading edge of the shelf above the line of writing on the platen. This shelf is preferably made of sheet material with the side edges bent up at right angles to provide guide ledges 98' for the side edges of the paper. The rear longitudinal edge of the shelf is downwardly curled or curved as at 99 to engage over studs 100 carried by brackets 101 secured to and projecting upwardly from the platen frame ends, said studs extending inwardly from the platen frame ends and parallel with the platen. By so mounting the shelf it is adapted to be adjusted to throw the leading edge thereof into or out of engagement with the platen. To maintain the writing sheet in contact and flat against the shelf as it is fed by the platen and feed rollers 41, 42 rollers 102, shown as two in number, are provided to engage with the top of the paper shelf. These rollers are carried by resilient arms

or fingers 103 mounted on a rod 104 extending longitudinally above the shelf and rotatably supported at its ends in the shelf ledges 98'. To maintain these fingers in position on the rod to yieldingly urge the rollers 102 against the paper shelf, the rod has a flattened portion 105 with which the free ends of a bow spring member 106 carried by the fingers is adapted to normally engage. By this arrangement the fingers may be rotated on the rod independently of each other to throw either one or both of the rollers into or out of engagement with the paper shelf, and to adjust the fingers along the rod.

To throw both of the fingers simultaneously out of or into engagement with the paper shelf a finger lever 107 is secured to one end of the rod outside of a shelf ledge 98', this finger lever being made of resilient material to operate as a detent to retain the rod and fingers in position with the rollers in or out of engagement with the paper shelf. For this purpose the finger lever has a protuberance 108 extending laterally thereof toward the shelf ledge and when the rollers are in engagement with the paper shelf engages in a perforation in the shelf ledge, and when the rod is adjusted to position with the fingers held in position with the rollers out of engagement with the paper shelf said protuberance engages with the top of the shelf ledge. To prevent throwing the roller carrying fingers too far back an ear 109 is bent laterally from the shelf ledge to serve as a stop for the finger-lever.

To facilitate the manual writing of music signs on the paper shelf in conjunction with the mechanically written music notations there is provided a templet 110 of transparent sheet material, such as celluloid, (Fig. 21, Sheet 2). This templet is provided with elongated curvilinear edges of regular or irregular form to serve as guiding edges for the writing of slurs and the like, and at the left hand end with a curved edge to facilitate the writing of braces to connect staves. One of the longitudinal edges is provided with a graduated scale representative of spaces of music notation. This templet is placed over the paper on the paper shelf after the mechanically written music notations have been impressed thereon and used to mark on the sheet slurs and the like to tie or connect such music notes as it is desired.

As stated it is an object of the invention to provide an improved lay-out for a keyboard for use in connection with writing machines for the writing of musical composition. For this purpose the usual standard finger key arrangement of commercial typewriting machines is utilized, and shown as consisting of forty two keys connected to

impression making devices operating levers and arranged in four alined banks 111, 112, 113 and 114. In addition to these keys there are utilized the usual back spacer key 115
 5 connected to mechanism to back space the platen carriage, the tabulator key 116 connected to tabulating mechanism, and the shift keys 39 connected to the platen carriage shifting levers. In the rear and above
 10 the fourth bank of keys the keys for the platen advancing and retracting levers 77, 78 are arranged. These keys are eight in number, the four keys 77 at the left carrying the numeral characters 1, 2, 3 and 4 reading
 15 from left to right, and the four keys 78 at the right carrying numeral characters 1, 2, 3, and 4 reading from right to left, and said characters being indicative of the increment of movement imparted to the platen,
 20 either forwardly or backwardly, and such movement being equal to the number of diatonic degrees of the music staff to which the platen will be adjusted upon the actuation of such keys. Each of the keys of the banks
 25 of keys 111, 112, 113 and 114 carry two music notation characters which are applied directly to the key or are on a tablet which is applied to the keys and are indicative of the characters which will be produced upon the
 30 actuation of the keys. In this connection it is to be understood that in the mechanism for writing music notation silent key mechanism is utilized, that is mechanism in which the platen carriage feeding devices will not
 35 be operative upon the actuation of such finger key, thereby permitting the writing of compound music characters. For instance, in writing the treble clef, in consequence of the large size thereof such character is divided horizontally, the key carrying
 40 the lower portion of such character being connected to silent key mechanism and as such key and the connected impression making device are actuated the platen carriage feeding devices are not actuated with
 45 the result that when the upper portion of such character is printed which is carried by another key actuated mechanism such portion of the character will be printed directly
 50 above and in conjunction with the lower portion and thereby building up the character. Before writing the upper portion of such character the key 77 carrying the numeral character "4" is depressed thereby retracting
 55 the platen four diatonic degrees and positioning the platen to receive the upper portion of the treble clef character in proper relation to the lower portion which has been printed.
 60 The second bank of keys 112, which is the first in importance, are connected to impression making devices for the common music notes on the lower case and which are indicated on said keys; on the left of said
 65 bank of keys the note stems extend upward

while on the right the stems extend downward. This up and down arrangement of duplicate stems and characters is for the purpose of assisting the operator in memorizing their positions and to expedite operation. The indications for the characters of the upper case characters follow the same principle.

The third bank of keys 113 and the second in importance are connected to impression making devices for producing simple characters, and such characters as may be compounded or built up, with most of the characters which may be compounded at the right of such bank for operation by the right or dexterous hand. This latter principle in the arrangement of the characters on the keys is repeated in the first and fourth banks of keys. The key at the extreme right in the third bank of keys is also connected to
 85 silent key mechanism.

The first bank of keys, and the third in importance, carry characters representative of simple abbreviations and others that may be built up or compounded.

In the fourth bank of keys, and the fourth in importance, certain of the keys carry on the lower case numeral characters representative of applying the fingers to the keys or strings of different instruments and which
 95 are printed upon the actuation of said keys, and other keys of said bank contain special characters and characters to be compounded or built up. Certain of the keys in the upper case carry numeral characters representative of time and other keys special characters. The third key from the right in said bank carries the indication of the lower portion of the treble clef and is connected to
 100 silent key mechanism.

Each of the keys also have five parallel horizontal lines and four spaces between said lines representative of the nine diatonic sounds or degrees of the music staff, and two parallel perpendicular lines, and the characters are so located on the keys with relation to said horizontal and perpendicular lines to indicate the position the printed characters will assume on the paper upon the actuation of the respective keys with the platen
 115 in normal position and the paper adjusted on the platen with the first line of the staff in register with the platen scale. In said position of the platen and paper the lower case characters will be printed or reproduced
 120 on the music paper between the first and second spaces or the first and third lines of the staff in accordance with the size of the character. To raise the tone of a note or the position of a character indicated by the
 125 key gage horizontal lines one, two, three or four diatonic tones or degrees, or a multiple of such degrees, the platen line spacing keys 77 are actuated; to lower the tone or the position of a character one, two, three or
 130

four diatonic tones or degrees, or a multiple thereof, the platen line space keys 78 are actuated. The perpendicular position of the notes or characters on the music paper indicated by the perpendicular lines on the keys is changed by the actuation of the platen carriage feeding devices upon the actuation of the impression making devices, the space bar, tabulator key, or back spacer key.

Having thus described my invention, I claim:

1. In a writing machine, the combination with a carriage carrying a platen, and impression making devices, of finger key lever actuated means to advance and retract the platen predetermined distances at will, and means to shift the platen carriage to change the position of the line of writing on the platen and shift the lever actuated platen advancing and retracting means with the platen carriage for the purpose specified.

2. In a writing machine the combination with a carriage carrying a platen, and impression making devices, of selective finger-lever actuated means to advance and retract the platen predetermined distances at will; and means to shift the carriage to change the position of the line of writing of the platen and simultaneously shift the platen advancing and retracting means with the platen for the purpose specified.

3. In a writing machine, the combination with a carriage and a platen rotatably supported therein, of a supporting rail along which the carriage is longitudinally movable and said rail being operable to shift the carriage to change the writing line on the platen; means carried by the rail operable to rotate the platen; and selective finger key levers operative to actuate said platen rotating means to advance the platen predetermined variable distances in line space direction and retract the same.

4. In a writing machine, the combination with a rotatable platen and impression making devices, of means to rotate the platen; and two sets of depressible levers one set of levers being operable to advance the platen predetermined distances in line space direction, and the other set of levers being operative to retract the platen predetermined variable distances from the positions to which the platen has been advanced by the first set of levers for the purpose specified.

5. In a writing machine, the combination with a platen and impression making devices, of means to rotatively advance and retract the platen; a set of depressible levers to actuate the platen advancing and retracting means to move the platen predetermined distances in one direction; and a second set of depressible levers to actuate the platen advancing and retracting means to move the

platen predetermined distances in reverse direction.

6. In a writing machine, the combination with a rotatable platen and impression making devices of means to rotatively advance and retract the platen; depressible key levers to operate said platen advancing and retracting means; and a plate arranged with gage slots in which the levers operate to limit the depression of the levers and thereby control the movement of the platen actuating means and the rotation of the platen for the purpose specified.

7. In a writing machine, the combination with a platen and means to shift the platen to upper and lower case position, of selective means operable to advance and retract the platen predetermined variable line space distances shiftable with the platen shifting means and operable in either writing position of the platen for the purpose specified.

8. In a writing machine, the combination with a platen and means to shift the platen to change the line of writing of the platen, of means operable to rotatively advance and retract the platen predetermined distances and shiftable with the platen shifting means and depressible levers to actuate said platen advancing and retracting means for the purpose specified.

9. In a writing machine, the combination of a platen arranged to have longitudinal movement and movement transversely to its longitudinal movement; a rotatable shaft longitudinally movable with the platen and geared to the platen; a pinion mounted on the shaft to rotate therewith and relative to which the shaft is axially movable; and means to rotate said pinion and therewith shaft to move the platen transversely to its longitudinal movement.

10. In a writing machine, the combination of a longitudinally movable platen; a rotatable shaft longitudinally movable with the platen operable to line space the platen; a pair of ratchet wheels on said shaft to rotate therewith and relative to which the shaft is axially movable; and means to impart predetermined rotative movements in opposite directions to the ratchet wheels and thereby the shaft to line space the platen in forward and reverse direction predetermined distances.

11. In a writing machine, the combination of a longitudinally movable platen; a rotatable shaft geared to the platen operable to line space the platen and longitudinally move with the platen; a pair of ratchet wheels on said shaft to rotate therewith and relative to which wheels the shaft is axially movable; and depressible lever actuated means to cooperate with one of said wheels to rotate the same and shaft in one direction to line space the platen pre-

determined distances in one direction, and to cooperate with the other wheel to rotate the same in a direction reverse to the other wheel to line space the platen in reverse direction.

12. In a writing machine, the combination of a platen carriage and a platen rotatably mounted therein; a shaft rotatably carried by the carriage and geared to the platen; a toothed wheel on said shaft; pawl and ratchet mechanism operable to rotate the wheel and shaft to line space the platen; and two sets of key levers one set of levers being operable to actuate the pawl and ratchet mechanism to rotate the wheel and shaft in one direction and line space the platen forwardly variable predetermined distances, and the other set of levers being operable to actuate the ratchet mechanism to rotate the wheel and shaft in reverse direction and line space the platen in reverse direction variable predetermined distances.

13. In a writing machine, the combination of a rotatable platen; a shaft geared to the platen operable to line space the platen; a toothed wheel on said shaft; ratchet mechanism to rotate the wheel and shaft to line space the platen forward and backward; and depressible levers to impart variable movements to the ratchet mechanism to rotate the wheel and shaft in opposite directions and line space the platen forward and backward at will predetermined distances.

14. In a writing machine, the combination of a platen mounted to have to and fro longitudinal movement and movement transversely to its longitudinal movement; a rotatable shaft geared to the platen and participating in the longitudinal movement of the platen; a toothed wheel on the shaft rotatable therewith but not participating in the longitudinal movement thereof; a ratchet to rotate said wheel and thereby the shaft; a series of depressible levers to impart variable movement to the ratchet to rotate the wheel and shaft and line space the platen predetermined distances.

15. In a writing machine, the combination of a platen mounted to have to and fro longitudinal movement; a rotatable shaft geared to the platen and participating in the longitudinal movement thereof; a pair of toothed wheels rotatable with said shaft but not participating in the longitudinal movement thereof; means to impart rotative movement to one of said wheels and shaft to advance the platen predetermined distances; and means to impart rotative movement to the other of said wheels and shaft to retract the platen predetermined distances.

16. In a writing machine, the combination of a platen mounted to have to and fro movement longitudinally; a rotatable shaft geared to the platen and participating in

the longitudinal movement thereof; a pair of toothed wheels rotatable with shaft but not participating in the longitudinal movement thereof; means to impart variable rotative movements to one of said wheels in one direction to advance the platen predetermined distances and to impart variable rotative movements to the other wheel in a direction opposite to the movement of the first wheel to retract the platen predetermined distances, and depressible levers to operate said toothed wheel actuated means for the purpose specified.

17. In a writing machine, the combination of a platen; a toothed wheel operatively connected to the platen to transmit the rotative movement of the wheel to the platen; a ratchet to cooperate with the wheel to rotate the same and the platen; a slide connected to the ratchet; and a lever to impart movement to the vertically movable slide to move the ratchet to cause the ratchet to cooperate with the wheel to rotate the wheel and line space the platen.

18. In a writing machine, the combination of a platen; a toothed wheel operatively connected to the platen to transmit the rotative movement of the wheel to the platen; a ratchet to cooperate with the wheel to rotate the wheel and platen; a vertically movable slide connected to the ratchet; and a series of levers operable to move the slide variable distances to move the ratchet to actuate the wheel and line space the platen predetermined distances.

19. In a writing machine, the combination of a platen; a toothed wheel operatively connected to the platen to transmit the movement of the wheel to the platen; a ratchet to cooperate with the wheel to rotate the wheel and platen; a slide connected to the ratchet; and levers adapted to have predetermined and different movements operable to move the slide variable distances to move the ratchet to actuate the wheel and line space the platen predetermined distances.

20. In a writing machine, the combination of a platen; a toothed wheel operatively connected to the platen to transmit the movement of the wheel to the platen; a ratchet to cooperate with the wheel to rotate the wheel and platen; a slide connected to the ratchet; pivoted levers having finger keys to move the slide; and a gage to govern the movement of the levers whereby to move the slide variable distances to move the ratchet to actuate the wheel and line space the platen predetermined distances.

21. In a writing machine, the combination of a platen; a pair of toothed wheels operatively connected to the platen to transmit the movement of the wheels to the platen; a ratchet for each of said wheels to impart movement to the wheels in opposite directions and impart forward and backward

movement to the platen; and selective means to actuate said ratchets to impart variable rotative movement to either of said wheels and advance and retract the platen predetermined distances.

22. In a writing machine, the combination of a platen; a pair of toothed wheels operatively connected to the platen to transmit the movement of the wheels to the platen; a ratchet for each of said wheels to impart movement to the wheels in opposite directions and impart rotative forward and backward movements to the platen; a set of levers to actuate one of said ratchets to impart variable rotative movement to one of the wheels to rotatively advance in one direction the platen predetermined distances; and a set of levers to actuate the other of said ratchets to impart variable rotative movement to such wheel to rotatively retract the platen predetermined distances.

23. In a writing machine, the combination of a platen; a pair of toothed wheels operatively connected to the platen to transmit the movement of the wheels to the platen; a ratchet for each of said wheels to impart movement to the wheels in opposite directions and impart forward and backward rotative movements to the platen; a vertically movable slide connected to each ratchet; and selective means to raise the slides predetermined distances to actuate the ratchets to advance and retract the platen predetermined distances.

24. In a writing machine, the combination of a platen; a pair of toothed wheels operatively connected to the platen to transmit the movement of the wheels to the platen; a ratchet for each of said wheels to impart movement to the wheels in opposite directions and impart forward and backward rotative movements to the platen; a vertically movable slide connected to each ratchet; a set of levers having finger keys to raise one of said slides to cause its connected ratchet to rotate its coöperating wheel to rotatively advance the platen predetermined distances; a set of levers having finger keys to raise the other of said slides to cause its connected ratchet to rotate the other wheel to rotatively retract the platen predetermined distances; and springs to return the slides.

25. In a writing machine, the combination of a rotatable platen mounted to have longitudinal to and fro movement; a shaft geared to the platen and participating in the longitudinal movement thereof; a pair of toothed wheels on said shaft to rotate therewith but not participate in the longitudinal movement thereof; a ratchet for one wheel pivotally carried by the shaft arranged to rotate one of said wheels in one direction and advance the platen; a ratchet for the other wheel pivotally carried by the shaft

arranged to rotate the other wheel in a direction opposite to the rotation of the first wheel to retract the platen; a vertically movable slide connected to each ratchet; and selective means to impart variable movements to the slides and actuate the ratchets to rotate the wheels different distances to advance and retract the platen predetermined distances.

26. In a writing machine, the combination of a rotatable platen mounted to have longitudinal movement; a shaft geared to the platen and participating in the longitudinal movement of the platen; a pair of toothed wheels on said shaft to rotate therewith but not participate in the longitudinal movement thereof; a ratchet for one wheel pivotally carried by the shaft arranged to rotate one of said wheels in one direction and advance the platen; a ratchet for the other wheel pivotally carried by the shaft arranged to rotate the other wheel in a direction opposite to the rotation of the first wheel to retract the platen; a vertically movable slide connected to each ratchet; a set of levers having finger keys adapted to have different movements to impart variable movements to one of said slides to actuate one of the ratchets and rotate one wheel different distances to advance the platen predetermined distances; a set of levers having finger keys also adapted to have different movements to impart variable movements to the other slide to actuate the other ratchet and rotate the other wheel different distances to retract the platen predetermined distances; and springs to return the slides.

27. In a writing machine, the combination of a rotatable platen mounted to have longitudinal to and fro movement; a shaft geared to the platen and participating in the longitudinal movement thereof; a pair of toothed wheels on said shaft to rotate therewith but not participate in the longitudinal movement thereof; a ratchet for one wheel pivotally carried by the shaft arranged to rotate one of said wheels in one direction and advance the platen; a ratchet for the other wheel pivotally carried by the shaft arranged to rotate the other wheel in a direction opposite to the rotation of the first wheel to retract the platen; a vertically movable slide connected to each ratchet; selective lever mechanism to impart variable sliding movements to either of said slides to actuate the ratchets; and means to shift the platen to change the position of the line of writing of the platen and arranged to shift the platen advancing and retracting mechanism therewith.

28. In a writing machine, the combination with the framework, a platen, a carriage to rotatably support the platen to have to and fro longitudinal movement, and a rail upon which the carriage is supported adjustable

to shift the carriage to change the writing line of the platen, of a rotatably supported shaft carried by the rail and geared to the platen to participate in the longitudinal movement thereof; a pair of toothed wheels on the shaft to rotate with the shaft but have no participating longitudinal movement with the shaft; a ratchet for each wheel pivotally connected to rings loose upon the shaft, one of which ratchets is arranged to move one wheel in one direction to advance the platen, and the other ratchet arranged to move the other wheel in a direction opposite to the movement of the first wheel to retract the platen; a slide connected to each of said ratchets supported in a bracket fixed to the framework to have longitudinal vertical movement; selective lever mechanism to impart variable movements to the slides and actuate the ratchets to rotate the wheels different distances to advance and retract the platen predetermined distances; and a lever supporting bracket mounted in the frame-work to have vertical sliding movement and connected to the rail to participate in the shifting movement thereof and shift the lever mechanism and slides with connected mechanism therewith, said lever support also having a gage plate to limit the movement of the levers.

29. A keyboard for machines to write musical composition or score, comprising keys having music characters thereon and parallel lines indicative of a music staff and the position of the characters thereon.

30. A keyboard for machines for writing music composition or score, comprising keys arranged in a series of banks having music symbols or characters thereon with parallel horizontal lines indicative of the

music staff, and vertical parallel lines to indicate the position of the characters relative to the staff.

31. In a music writing machine, the combination with a platen and impression making devices, of levers to actuate the impression making devices, and levers to actuate means to rotatively advance and retract the platen predetermined distances; finger keys for said levers, the keys for the platen advancing and retracting levers having characters thereon indicative of the degree of movement imparted to the platen and representative of the music staff, and the keys for the impression making devices operating levers having music characters thereon and parallel horizontal lines indicative of the music staff.

32. In a music writing machine, the combination with a platen and impression making devices, of levers to actuate the impression making devices and levers to actuate means to rotatively advance and retract the platen predetermined distances; finger keys for said levers arranged in alined banks with the finger keys for the platen advancing and retracting levers rearmost, said keys for the advancing and retracting levers having characters thereon indicative of degree of movement imparted to the platen by the actuation of said levers, and said keys for the impression making devices operating levers having music characters or symbols thereon and parallel lines indicative of the music staff and the position of the characters being written by the operation of the connected levers; and keys connected to tabulator, back spacing and platen shifting levers and having inscriptions indicative of said levers.

ROBERT J. ORR.