J. S. RIVERA.

MACHINE FOR TYPE WRITING MUSICAL SIGNS AND INDICATIONS.

APPLICATION FILED JUNE 12, 1912.

1,063,470.

Patented June 3, 1913

3 SHEETS—SHEET 1.

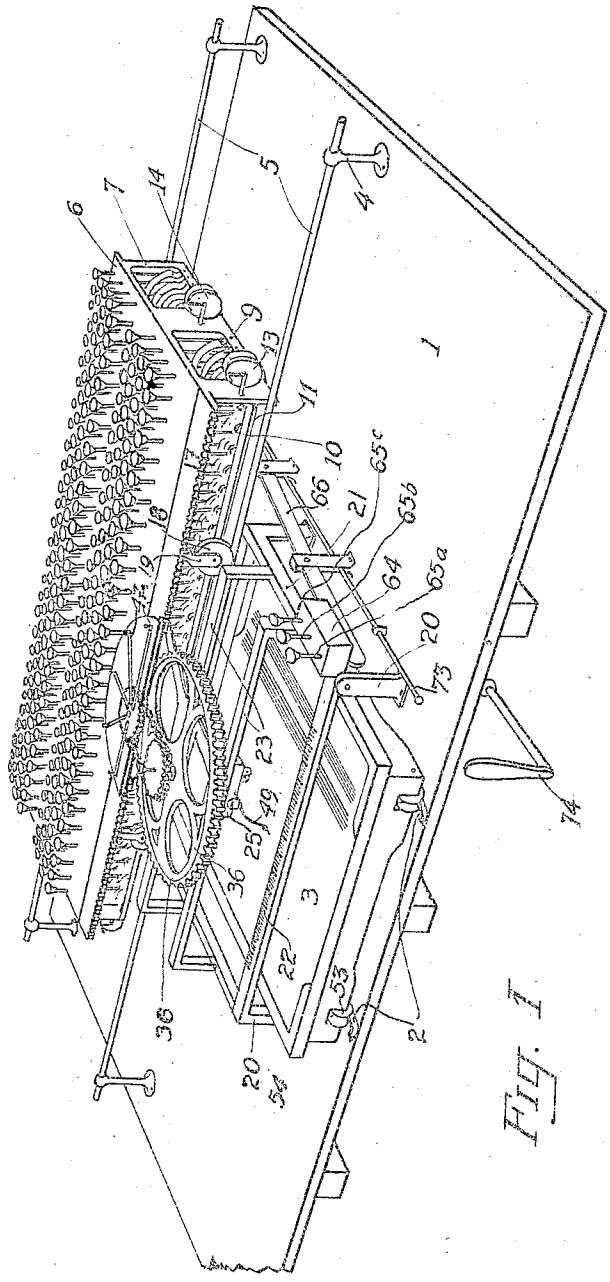


Fig. 1

Witnesses:
Edward Whitman
C. J. McGee.

Inventor:
José Sanz huja Rivera
By Emil Bonnelycke
Attorney.

J. S. RIVERA.

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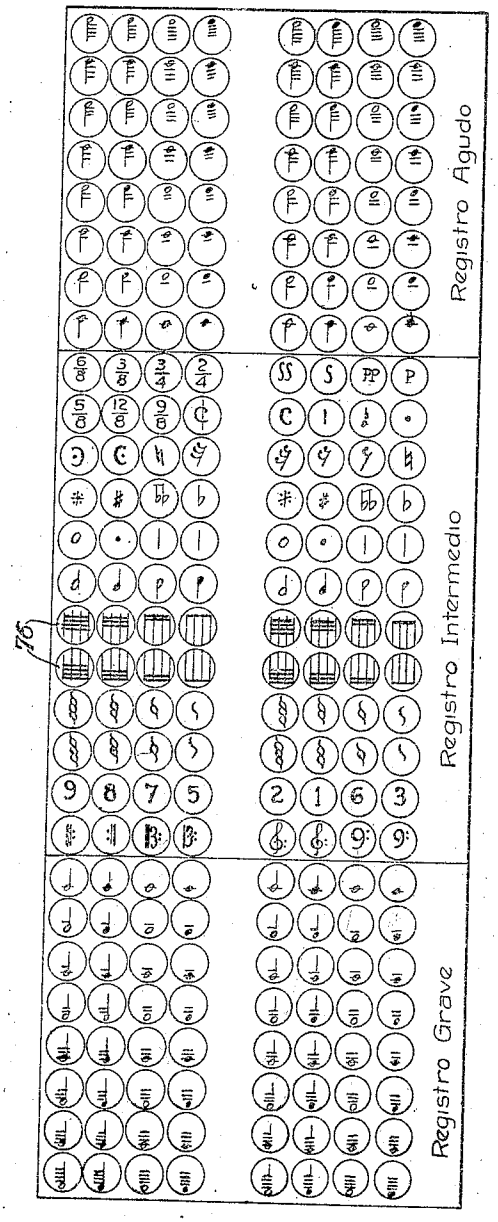


Fig. 2

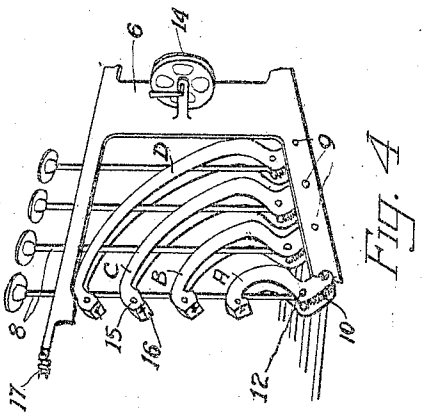


Fig. 4

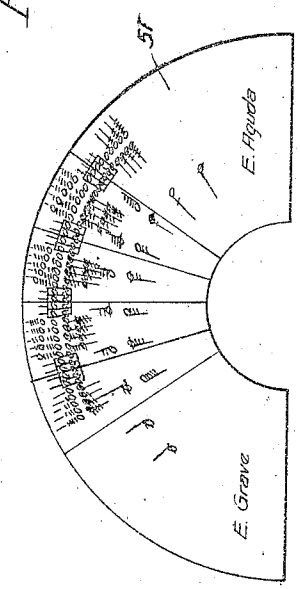


Fig. 3

Witnesses:
Edward R. Ritzmann
E. G. McGee.

Inventor:
José Sanahuja Rivera
By David Bamelyche
Attorney

J. S. RIVERA.

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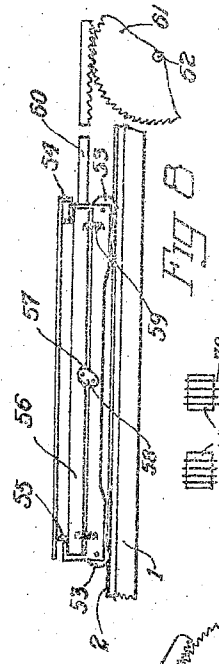


Fig 8

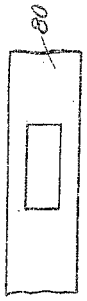


Fig 9

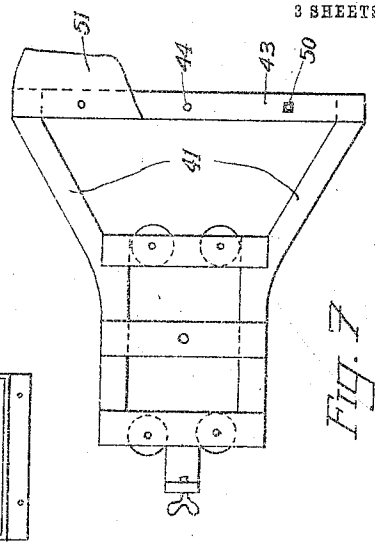


Fig. 7

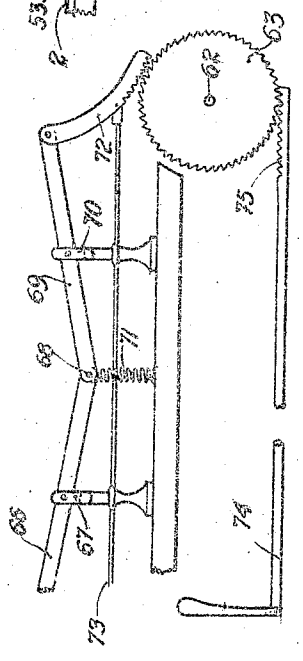


Fig 5

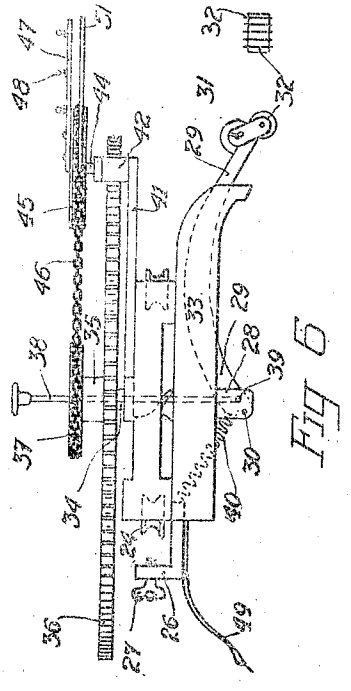


Fig 6

Witnesses:
Edward A. Robertson
E. G. McGee.

Inventor:
José Sanahuja Rivera
By Louis Bonnelycke
Attorney.

UNITED STATES PATENT OFFICE.

JOSÉ SANAHUJA RIVERA, OF MIXCOAC, MEXICO.

MACHINE FOR TYPE-WRITING MUSICAL SIGNS AND INDICATIONS.

1,063,470. Specification of Letters Patent. Patented June 3, 1913.

Application filed June 12, 1912. Serial No. 703,223.

To all whom it may concern:

Be it known that I, JOSÉ SANAHUJA RIVERA, a subject of the King of Spain, residing at Mixcoac, Federal District, Mexico, have invented certain new and useful Improvements in Machines for Type-Writing Musical Signs and Indications, of which the following is a specification.

My invention relates to a type-writing machine for printing the musical staff and, also, music notes, rests and other signs.

Hitherto, the writing and especially the reduplication of music, as by printing, have presented great difficulties. The notes in sheet music have had to be reproduced by lithography, to secure the best effects, although printing by types is known. The present invention is of especial value, in substituting for the laborious slow and uneven hand-writing characters, printed notes and signs accurately alined automatically; the notes of the same value and pitch always being represented by symbols of exactly the same size, while the inscription can be made with rapidity and a degree of execution and cleanliness wholly out of the question with the manuscript process.

A particular advantage incident to the present invention is that it enables stencils to be prepared for lithographic reproduction of music, and also facilitates the preparation of electrotype plates, so that reduplication may be at once made in any desired number of copies without resorting to the cumbersome and often inaccurate reproduction by type set after the manner of those used in ordinary printing.

The apparatus consists essentially of a frame in which a carriage is slidably mounted, said carriage containing the music key-board, consisting of all the notes and ordinary signs used in writing music. Means are provided for accurately determining the distance between successive impressions, so as to insure the proper position of every note, rest and sign with reference to the lines of the staff. The paper to be inscribed is supported by a platen, while a writing band or ribbon is secured over the paper, the paper and ribbon being traversible, to predetermined distance. A staff ruling device is provided, which marks the staff where required and may be put out of operative position.

For writing words and letters, the music key-board with its supporting carriage is removed, a distinct key-board of ordinary types being substituted for it.

The above and other features incident to the invention which will be set forth in the following description and particularly pointed out in the appended claims, are illustrated in the accompanying drawings, in which:

Figure 1. is a perspective view of the type-writing machine. Fig. 2. is a plan of the key board. Fig. 3. is a plan of the sector index. Fig. 4. is a detail view of the keys. Fig. 5. is a detail view of the spacer mechanism. Fig. 6. is a side elevation of the guide carriage. Fig. 7. is plan view of the same. Fig. 8. is a detail view of the paper carrier. Fig. 9. shows the rollers for printing the stem connecting strokes and their inking rollers.

The machine comprises a table (1) upon which two rails (2) for the paper carrier (3) are mounted, and mounted transversely of these rails upon uprights (4) is another rail track (5) for the keyboard carriage (6). This rail track (5) is disposed above the table (1) so that the paper carrier (3) may be moved below it. The key-board carriage (6) is composed of a casing (7) in which the keys (8) are arranged in 28 transverse rows, and 3 longitudinal rows divided into two longitudinal sections. Each longitudinal row of keys is pivotally mounted upon a longitudinal shaft (9) that is fixed at its ends in the end members of the casing (7), and each key, as shown in Fig. 4, consists of a depressible key bar and a type bar comprising a pair of spaced members between which the key bar passes and to which it is connected at its lower end by a pivot-pin (12) that joins the angular or forwardly off-set portions of said members. The shafts (9) pass through the lower ends of each pair of these members, so that the same are free to rock thereon when the corresponding key bars are depressed, and the upper ends thereof are joined by pins (15)

to which type (16) are soldered. Spiral springs (10) are employed to normally hold the keys in raised position, said springs bearing at their upper ends against the pins (12) and at their lower ends against the bottom (11) of the casing. The transverse rows of keys of each section of the key-board have a common striking point, as will be understood, and for this reason the front rows of type bars A of each section are shorter than the next type bars B, which latter are shorter than the type-bars C, and they, in turn, are shorter than the type bars D.

At the ends of the casing (7) are disposed the front and rear ribbon spools (13) and (14), upon which the ends of the two ribbons (80), one for each section of the key-board, are wound, said ribbons passing below said casing. At its front and rear edges the said casing (7) is provided with overhanging ledges, the former of which is formed with teeth (17) and thus constitutes a rack. From each of these ledges depends a pair of hangers (19), carrying rollers or wheels (18) that travel along the adjacent rail (5), the front hangers and wheels alone appearing in Fig. 1, as will be understood. In advance of the front rail (5), there is mounted upon upright (20) a frame (21) whose front member (22) is marked with both inch and millimeter scales. Upon this frame are mounted two parallel longitudinal rails (23) having rounded edges against which travel the adjacent sets of wheels (24) of the guide carriage (25). The aforesaid carriage (25) is provided at its front with an up-turned bracket (26), through which passes a clamping screw (27) for retaining the carriage in adjusted position upon the rails (23), said screw being adapted to engage the front rail when turned in the proper direction. From the under side of the carriage depend two lugs (28) that are connected by a horizontal pin (30), and to this pin are pivoted the front ends of a pair of rearwardly extending spaced arms (29) whose rear ends support the staff-ruling roller (32) and, also, an inking roller (31) which is disposed in contact therewith. The arms (29) are normally maintained in raised position by means of spiral springs (40), that are connected to the carriage at their front or upper ends and at their rear or lower ends to a cross-pin (39) that joins the heel portions of said arms and is located rearwardly of pin (30), said pin (39) having connected to it the lower end of a depressible key bar (38), which latter, when actuated, serves to rock arms (29) downwardly, so as to bring the roller (32) into contact with the paper. During their rocking movements, the arms (29) are guided by side bars (33) affixed to the bottom of the carriage. The above-mentioned key bar (38) passes through a vertical sleeve (34) rigidly secured to the carriage, and upon this sleeve is rotatably mounted the hub portion (35) of a compound gear whose lower member is in the form of a relatively large pinion (36) that meshes with rack (17), and whose upper member is constituted by a sprocket (37). Said sprocket is connected by a chain (46) with a similar sprocket (45) which is secured to a short vertical shaft (44) that is journaled in a bearing provided in a bridge (43), the latter being borne by uprights (42) mounted upon the ends of a pair of rearwardly-extending diverging arms (41) that form a part of the carriage. (See Figs. 6 and 7). Sprocket (45) is provided upon its upper face with five pointer arms (47), having terminal knobs or handles (48). A needle or indicator (49), that traverses the scale bar (22) is affixed to the bracket (26) at the front of the carriage. The pointers (47) extend over a sector-shaped index (51), provided with musical graduations, as shown in Fig. 3, and supported upon uprights (50) mounted upon bridge (43).

The paper carrier (3) is preferably in the form of a square plate faced with rubber or other suitable material of a like nature. It is provided at its corners with wheels (53) that engage the rails (2), and it is also provided upon its top with a pair of paper clamps (54) that are connected by pins (55) or the like to a pair of lateral bars or strips (56) arranged at opposite sides of the carrier, these bars being forced downwardly by means of springs (59) to hold the clamps against said carrier. To raise said bars and thus release the paper, pivotally-mounted cams (58) or other suitable devices may be employed, said cams projecting into recesses (57) in said bars and being turned or operated in any desired manner.

The movements of the paper carrier are effected by means of devices here shown as comprising the following elements:—From the rear of said carrier, there projects a horizontal bar (60) whose lower surface is formed with rack teeth in mesh with a pinion (61) that is mounted upon one end of a horizontal, longitudinally-disposed shaft (62) and extends through an opening in the table (1). The other end of the shaft carries a similar pinion (63) that is normally engaged by the rack-like end (75) of an axially-movable shifting bar (74) and is periodically engaged by a gravity pawl (72). This pawl is operated by the spacing lever, which latter consists of front and rear members (66) and (69) arranged in axial alinement and fulcrumed intermediate their respective ends upon brackets (67) and (70), the aforesaid pawl being pivoted to the rear

or outer end of the member (69). The mutually adjacent inner ends of said members are pivotally connected together, as indicated by the numeral (68), Fig. 5, and said inner ends are normally depressed by a spring (71) which is connected thereto, the outer ends of said members being thus held in elevated position. The front lever member (66) projects beneath a casing (64) located at the right-hand side of frame (21) and containing three spacer keys (65ª), (65ᵇ) and (65ᶜ). These keys, when depressed, engage and depress the front end of the aforesaid member (66), thereby raising the pivoted inner ends (68) of both members (66) and (69) and depressing the rear end of the latter member, whereupon pinion (63) will be turned by pawl (72) a distance corresponding to the particular spacer key that was actuated. The movement of pinion (63) is transmitted through shaft (62) and pinion (61) to the rack bar (60), thereby effecting a proportionate movement of carrier (3). In the construction shown, the carrier is moved a distance of two millimeters when key (65ª) is struck, three millimeters when key (65ᵇ) is struck, and four millimeters when key (65ᶜ) is struck. To release pawl (72) from pinion (63), a push bar (73) is provided, said bar being slidably mounted in apertured lugs fixed to table (1). The afore-mentioned shifting bar (74) is similarly carried in lugs affixed to the under side of said table, and, when actuated, serves to move the carrier a distance equal to the space between the first longitudinal rows of keys of the front and rear sections of the keyboard carriage. It will be accordingly understood, from the foregoing, that the paper carrier (3) will be caused to move when either the shifting bar (74) or one of the three spacer keys is actuated. In the former instance, said carrier will be shifted a distance equal to the space above indicated, and in the latter instance it will be shifted a distance of two, three or four millimeters, according to the particular key depressed. In both instances, movement is imparted to the carrier consequent upon the rotation of shaft (62) and engagement of pinion (61) with rack bar (60).

The lower register of the keyboard, (see Fig. 2) comprises only the notes, both common and mordents, written below the staff, counting downward, do, si, la, sol, fa, mi, re, do, of which there is a whole note, a half note, and crotchet. As the notes of the middle register, which includes all written within the staff, namely re, mi, fa, sol, la, si, do, re, mi, fa, sol, require no especial type to mark or distinguish them according to their position, this being done by moving the carriage, only one type of each of the time-values of the notes would be required, excepting for those notes having stems, as these are sometimes written with the stem turned upward or downward, so that two sets of type for the stemmed notes are required. This register contains also sharps, flats, pauses, naturals, rests, clefs, numbers, release marks, and separate stems and crotchet bodies. The upper or high register comprises all the notes written above the staff to wit: la, si, do, re, mi, fa, sol, la, for each of which there must be provided a whole note, a half note and a crotchet, every alternate being written on a ledger-line, while those between lines have their position indicated by the corresponding number of ledger lines placed beneath them.

The types of the notes of the lower and upper registers are grouped together from left to right in the order in which the notes occur in the diatonic scale, as shown in Fig. 2, the middle register coming into the position most accessible to the operator; and the writing commences at the upper right corner of the paper carrier.

The operation of the machine is as follows: The paper carrier (3) is first pulled out to its full extent, the finger holders (54) then raised, and the requisite number of sheets of paper, with intermediate carbons, placed upon the carrier. The middle pointer arm (47) attached to sprocket (45) is then turned until it alines with the central radial line marked upon the sector index (51) and, also, with the fourteenth key, counting from the right, of the first longitudinal row of keys on the keyboard, the movement of the aforesaid pointed arm serving to rotate sprocket (37) through the agency of chain (46). Rotation of the latter sprocket causes rotation of pinion (36), to which it is connected, and said pinion, in turn engages the rack (17) on the front ledge of the keyboard carriage (6) and shifts said carriage to the required extent, the movement of the carriage being thus effected automatically consequent upon and in accordance with the rotation of sprocket (45), as will be understood. In order to start with the printing of the staffs, the set-screw (27) is loosened and the guide carriage (25) is pushed to the right along the rails (23), together with the keyboard carriage (6), so that on pressing down the key bar (38) the staff-printing roller (32) will be caused to strike the paper where the writing should start, (*i. e.* the upper right-hand corner of the paper). When this adjustment has been completed, the screw (27) is again tightened, and the paper carrier pushed inward, during which time the key bar (38) is kept pressed down so that the staff will thus be printed, extending from one side of the paper to the other. Thereafter, the paper carrier is again pulled out,

so that the printed staff will be below the striking point of the front set or section of keys. The clef key is then brought into line with the central radial line of the sector index (51) and is depressed to print the clef upon the staff, after which all of the notes, in proper succession, are printed in the same manner, by first bringing the keys into alinement and then moving the pointer arms (47) the requisite number of graduations on the said sector index toward either the left or the right, according to whether each particular note should be written in the high, intermediate or low register. When one line has been completely written, the screw (27) is again loosened, and the guide and keyboard carriages are moved toward the left the distance required between the staffs which is determinable from the scale bar (22).

The stroke keys, (76), (see Figs. 2 and 9), are different from the other keys, in that they do not carry printing type, but on the contrary, small rollers (77) formed with ridges (78). Inking rollers (79), one for the common section and one for mordents of said stroke keys, are attached to the bottom of the casing (7). The fixed ribbons (80) are stretched from one spool to the other, and are provided with an opening where the stroke keys would otherwise strike, this being necessary for the reason that the paper carrier is moved in the same manner for printing the strokes as for ruling the staffs.

When one note has been printed, the paper carrier is moved forward by depressing the proper spaced key (65^a), (65^b) or (65^c), which advances the pinions (63) and (61) and shifts the said carrier as hereinabove described. The shifting bar (74) is pulled out when it is desired to bring the paper carrier below the keys of the mordent section, with a resultant movement of said carrier, as has also been described.

What I claim is:

1. In a machine for typewriting musical notes and symbols, the combination, with a table; of a keyboard carriage and a guide carriage mounted for movement upon said table in parallel relation to each other; gearing connecting said carriages for moving the keyboard carriage from the guide carriage; a paper carrier mounted upon said table beneath and transversely of said carriages; and spacer mechanism for shifting said paper carrier.

2. In a machine for typewriting musical notes and symbols, the combination, with a table; of a keyboard carriage and a guide carriage mounted upon said table for movement parallel with each other; gearing connecting said keyboard carriage and said guide carriage for moving the former from the latter; and an indicating mechanism carried by said guide carriage for controlling the operation of said gearing.

3. In a machine for typewriting musical notes and symbols, the combination, with a table; of a keyboard carriage and a guide carriage mounted upon said table for movement parallel with each other; gearing connecting said keyboard carriage and said guide carriage for moving the former from the latter; and an indicating mechanism for controlling the operation of said gearing embodying a stationary index carried by said guide carriage, a movable element mounted upon said guide carriage and provided with a plurality of pointer arms movable across said index, and means connecting said element with one element of said gearing for operating the latter from the former.

4. In a machine for typewriting musical notes and symbols, the combination, with a table; of a keyboard carriage and a guide carriage mounted upon said table for movement parallel with each other; a longitudinal rack connected to the front edge of the keyboard carriage; a pinion carried by the guide carriage in mesh with said rack; and means for rotating said pinion to move said keyboard carriage.

5. In a machine for typewriting musical notes and symbols, the combination, with a table; of a keyboard carriage and a guide carriage mounted upon said table for movement parallel with each other; a longitudinal rack connected to the front edge of the keyboard carriage; a pinion carried by the guide carriage in mesh with said rack; a stationary index and a rotatable element carried by said guide carriage, said element having a plurality of pointers movable over said index; and a connection between said element and said pinion for rotating the latter from and in unison with the former.

6. A machine for typewriting musical notes and symbols having a keyboard carriage in which the type keys for the common and mordent notes and signs are disposed in groups of four arranged transversely of the carriage, the groups of notes being arranged in the order in which the notes occur in the diatonic scale and each group representing the same whole, half and fourth note with and without stems, the types of each group having a common striking point.

7. A machine for typewriting musical notes and symbols having a guide carriage provided with a pair of spaced supporting arms pivotally connected thereto at their front ends; a staff-ruling roller and an inking roller in contact with the same carried by said arms at their rear ends; means connected with said arms for normally holding

the second-named ends thereof and said rollers in elevated position; a cross-pin connecting said arms intermediate their ends; and a depressible element connected to said cross-pin for lowering said arms and said rollers.

8. In a machine for type-writing musical notes and symbols, the combination, with staff-ruling means, and note-printing keys; of a separate set of keys for printing the stem-connecting strokes, each of said stroke-printing keys including a roller provided with circumferential ridges for ruling said strokes; and an inking roller associated with each first-named roller.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSÉ SANAHUJA RIVERA.

Witnesses:

K. GRANDJEAN,

W. ARCOS.