

Nov. 21, 1950

L. M. MARTIN
PIANO KEY

2,530,712

Filed Jan. 9, 1948

2 Sheets-Sheet 1

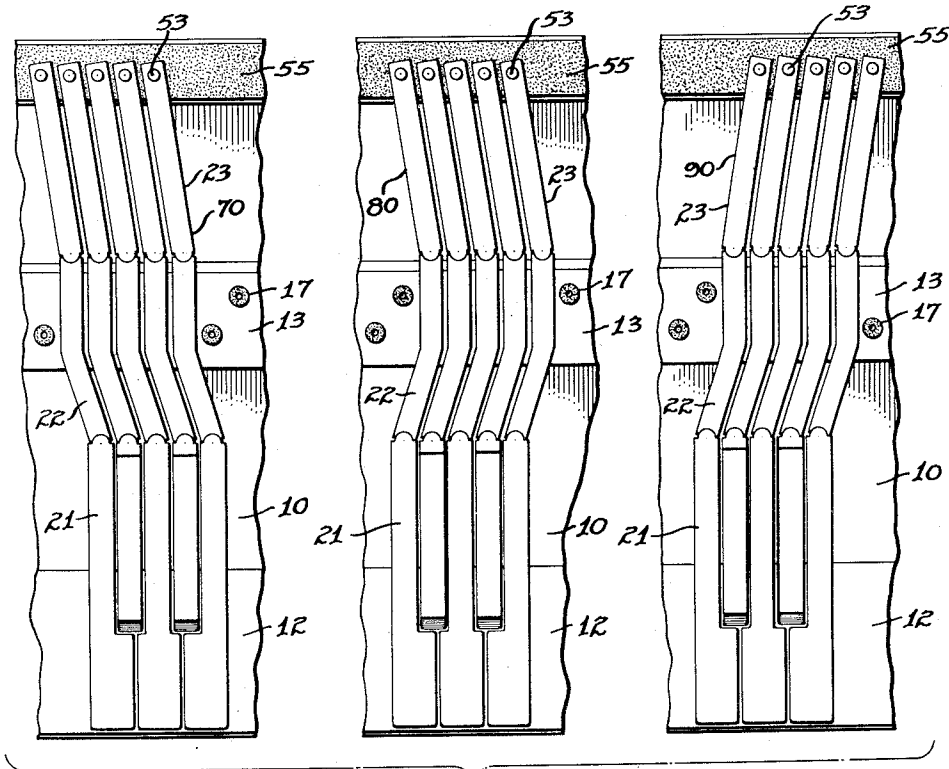


Fig. 1

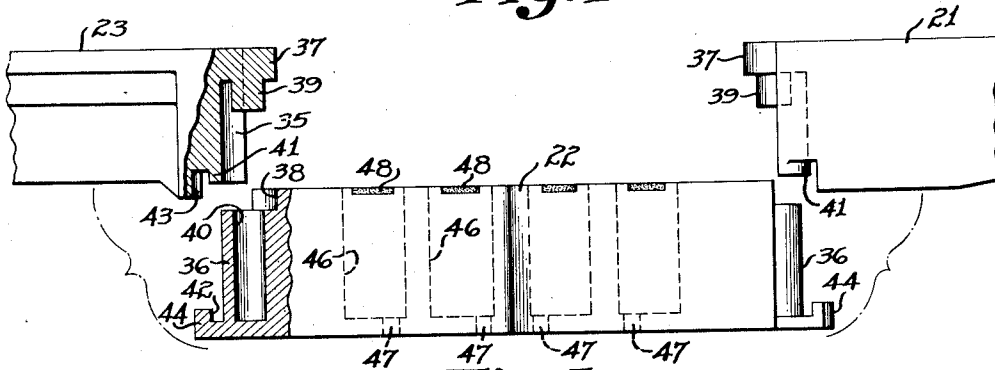


Fig. 5

INVENTOR.
Lloyd M. Martin
BY
Lyon & Lyon
ATTORNEYS

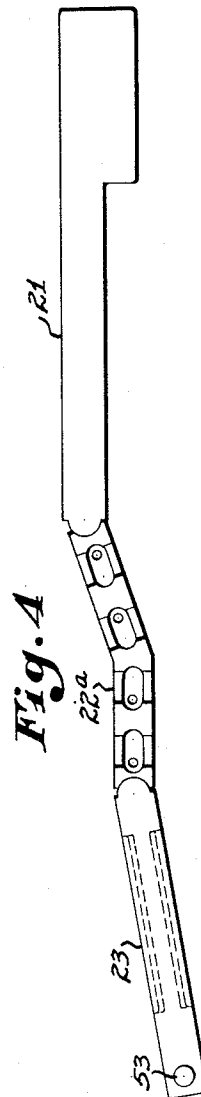
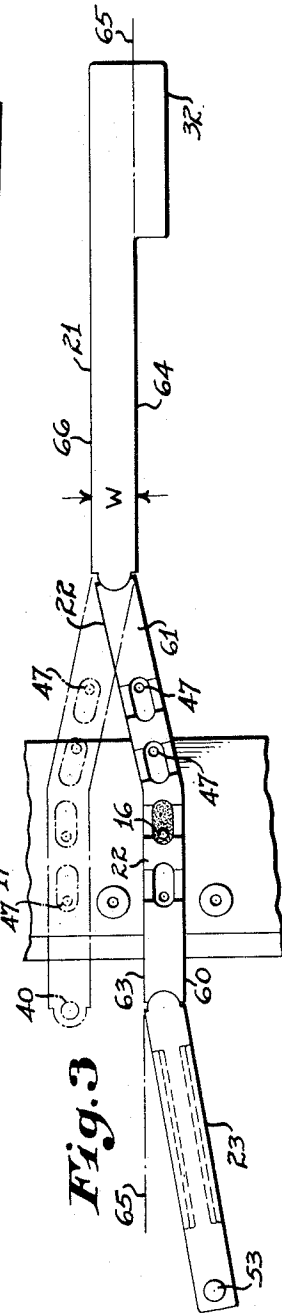
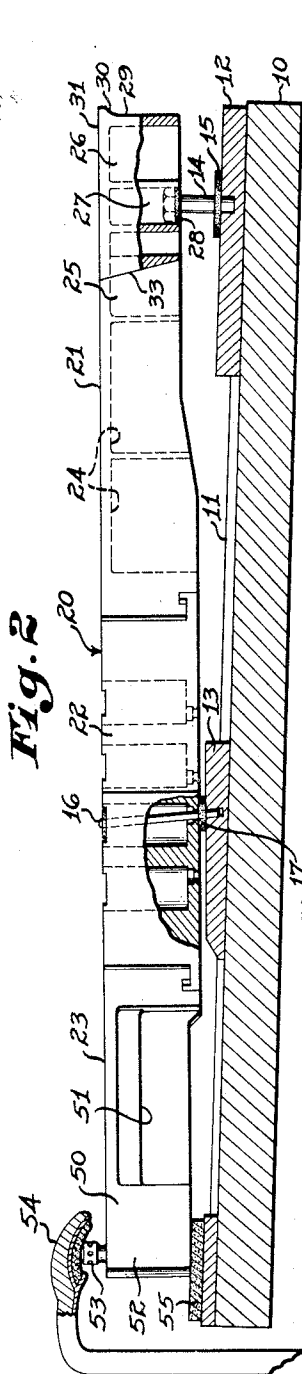
Nov. 21, 1950

L. M. MARTIN
PIANO KEY

2,530,712

Filed Jan. 9, 1948

2 Sheets-Sheet 2



INVENTOR.
Lloyd M. Martin
BY
Lyon & Lyon
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,530,712

PIANO KEY

Lloyd M. Martin, San Francisco, Calif.

Application January 9, 1948, Serial No. 1,450

8 Claims. (Cl. 84—433)

1

This invention relates to piano keys and more particularly to a key and lever made in a plurality of sections comprising a key piece, a center piece and a tail piece in which said tail piece and key piece are initially removable from said center piece in order that the ends may be reversed, thus reversing the key to form alternatively a treble clef or a bass clef.

Further, this invention relates to such a key or key lever which, by reason of its being formed in a plurality of small sections, is readily adaptable to plastic molding, thus providing an economical plastic key and key lever.

Further, this invention, by reason of the detachable and pivotal connections provided between the key piece and center piece and between the tail piece and center piece, is readily adaptable to any common scale.

Accordingly, it is one object of this invention to provide an improved piano key and key lever made of a plurality of severable sections to adapt said key and key lever to economic manufacture from molded plastic.

It is a further object of this invention to provide such a severable key and key lever which is readily adaptable to a wide range of piano sizes and scales.

It is a further object of this invention to provide such a key and key lever formed of three sections so that in the assembly of a piano scale all of the center pieces and tail pieces may be cast from one mold and all of the key pieces may be cast from the seven molds required to form the seven differing natural key forms plus one mold which suffices for all the sharps and flats, thus greatly reducing the cost of manufacture.

It is a further object of this invention to provide such a key and key lever the center piece of which is reversible to convert the key and key lever from treble clef to bass clef form, or vice versa.

It is a further object of this invention to provide such a key and key lever which, by reason of the initially pivotal connection of the tail piece to the center piece, is capable of adjustment to a wide range of scales.

Further objects and advantages will appear from the annexed specification in which:

Figure 1 is a fragmentary plan view of a piano keyboard employing keys and key levers embodying the present invention;

Figure 2 is a side elevation partly in section and with parts broken away for clarity of illus-

2

tration of a key and key lever embodying the present invention;

Figure 3 is a top elevation of a key and key lever embodying the present invention;

Figure 4 is a top view of an alternative key showing the adaptability of the invention to a center piece of reduced length; and

Figure 5 is an enlarged, fragmentary, exploded rear elevation of the key shown in Figure 2.

Referring more particularly to the drawings, there is shown a key bed 10 upon which a key frame 11 is affixed including a front rail 12 and a balance rail 13, all of which portions are commonly made of one integral block of wood or other suitable material. Mounted upon the front rail 12 is a guide pin 14 and a felt punching 15 is placed upon the front rail 12 around said guide pin 14 as indicated. Mounted upon the balance rail 13 is a guide pin 16 and a felt punching 17 is similarly mounted around the pin 16 on the balance rail 13. The key and lever, indicated generally at 20, comprises a key piece 21, a center piece 22 and a tail piece 23.

The key piece 21 is provided with a pair of channels 24 for lightening the structure and reducing the amount of material required and is also provided with an L-shaped channel 25 and a U-shaped channel 26 for the same purpose. The U-shaped channel 26 is formed by the walls of the key and by the walls of a hollow post 27 adapted to register with the guide pin 14 as indicated. The two longitudinal walls of the bottom portion of the hollow post 27 are provided at their bottom edges with felt bushings 28 for cushioning the guide pin 14. The forward wall 29 of the key is beveled as at 30 to form a smooth contour leading into the upper wall 31 of the key.

As will be obvious to those skilled in the art, a complete set of piano keys will require five forms of natural keys and one form for the sharps or flats, and also an additional form for the two end keys. The form shown in Figures 2, 3 and 4 is a natural key such as, for instance, the key of E and has a laterally projecting portion 32 which has a beveled rear wall 33.

The inner end of the key piece 21 takes the form of a split cylinder 35 adapted to interlock with a complementary substantially semicylindrical wall 36 formed on the outer ends of the center piece 22, and the inner end of the key piece carries at its upper end a substantially semicylindrical solid piece 37 adapted to seat in a complementary socket 38, and also a post 39 depending from the piece 37 is provided adapted

to enter the bore 40 of the cylindrical piece 36. Further, at the bottom edge of the inner end of the key piece 21 a semicircular annular depending flange 41 is provided adapted to ride in a complementary annular recess 42 at the outer edge of the bottom of the center piece 22 as indicated, and a flange 43 is provided adapted to ride on the outer edge of the upstanding flange 44 forming the annular recess 42. All of the foregoing interlocking elements thus provide a removable pivotal connection between the key piece 21 and the center piece 22.

The center piece 22 is provided with a plurality of channels 46, shown here as four in number, and also there are indicated four bores 47 communicating with the channels 46 and forming balance rail pin holes. The upper edges of the longitudinal walls of the recesses 46 are provided with felt bushing pads 48 to cushion the balance rail pins in the well-known manner; and as will be apparent from Figure 2, the guide pin 16 is adapted to extend through one of the holes 47 into one of the recesses 46 and pivotally mount the key.

The inner end of the center piece 22 is formed in identically the same manner as the outer end and is adapted to form a pivotal interlocking connection with the outer end of the tail piece 23 which in turn is identical to the structure just described as comprising the inner end of the key piece 21, thus pivotally mounting the tail piece in the same manner as the key piece so that, in assembling, it is necessary to make only one form of center piece 22 which may be used either in the position shown in Figure 2 or turned end-for-end so as to reverse the slant of the key lever when passing from treble to bass clef, or vice versa, as shown in phantom in Figure 3.

The tail piece 23 comprises the interlocking connection with the center piece 22 as above described and a longitudinally extending bar 50 provided with easements 51 to lighten the structure and a solid end portion 52 providing a considerable range of area for positioning of the capstan 53 which will engage the abstract head 54 or, if desired, a whippen. A felt cushion 55 is provided in the inner end of the bed as indicated to cushion the inner end of the tail piece.

Referring now more particularly to Figure 3, it will be noted that the center piece 22 is formed of two sections 60 and 61 disposed at a large included angle to each other. This angular relationship between the portions 60 and 61 provides an offset permitting the alignment of the wall 63 of the center piece 22 and the wall 64 of the key piece 21 directly along a common line as, for instance, the line 65-65 as shown in Figure 3.

Further, it will be appreciated that this offset is exactly the distance w comprising the width of the thin section 66 of each of the keys, thus assuring that when the center piece 22 is reversed end-for-end as shown in phantom in Figure 3 and the parts realigned to the straight line relationship described, the inner end of the center piece has been thrown two key widths over. This will be apparent when it is noted that the distance x is exactly twice the distance w . This relationship is a requisite to adapt the key and key lever of this invention to universal drilling of the balance rail 13 for the guide pins 16. With this relationship it will be apparent that on such reversal the center piece will automatically fall so as properly to engage a guide pin 16 two pins over from the one it previously was adapted to engage before it was reversed.

The tail pieces 23 must be aligned so as to bring the capstans 53 in alignment with the mechanisms to be engaged thereby to actuate whatever type of piano action is employed. Accordingly, these tail pieces may be pivoted from their joints with the center pieces properly to dispose the capstans. In the embodiment shown, the inner end of the tail piece is capable of being adjusted over a wide range of final positions and is thus extremely adaptable to whatever scale is desired.

In the assembly of the piano keyboard of this invention, it is necessary to be provided with the requisite number of key pieces 21 in the varying forms required plus the required number of center pieces, which will in each case be identical, and the required number of tail pieces, which will in each case be identical. Once the keys have been aligned in their proper positions as shown in Figure 1, the pivoted joints between the key pieces and the tail pieces are made immobile. In the event the parts are made from molded plastic, as is the intention of the inventor, this can be accomplished simply by applying a plastic cement to the joints just prior to or just after setting in the required positions.

In the final assembly, it is desired to position the inner ends of the tail pieces all along a common line. This may be accomplished in this invention simply by sawing off the excess length of tail pieces not required for the positioning of the capstans 53.

It will be apparent from the above description that, with the key and key lever of this invention, a very simple, inexpensive mechanism is provided adapted to universal drilling of the balance rail despite the fact that the center pieces are reversible to accommodate passing from bass clef, as indicated at 70 in Figure 1, to middle clef, as indicated at 80 in Figure 1, or to treble clef as indicated at 90 in Figure 1.

Further, by reference to Figure 4 it will be apparent that, inasmuch as the key and key lever is initially of separable pieces, the center piece 22 as shown in Figure 2 may be replaced by a center piece 22a as shown in Figure 4 of different overall length but still the same key pieces 21 and 23 may be used, thus adapting the overall key and key lever of this invention to use with the varying lengths required in different pianos merely by substituting one common piece.

While there has been described what is at present considered a preferred embodiment of the present invention, it will be apparent to those skilled in the art that various modifications and changes may be made without departing from the essence of the invention, and it is intended to cover herein all such modifications and changes as come within the true scope and spirit of the appended claims.

What is claimed is:

1. A piano key and key lever comprising a key section, a center section and a tail section, and a detachable pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections.

2. A piano key and key lever comprising a key section, a center section and a tail section, and a detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections.

3. A piano key and key lever comprising a key section, a center section and a tail section, and a

detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections, said center section comprising two arms disposed at a large included angle to each other.

4. A piano key and key lever comprising a key section, a center section and a tail section, and a detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections, said center section comprising two arms disposed at a large included angle to each other, said arms being of such length that when said center section is turned end-for-end and rearranged with its inner arm in alignment parallel to said key section said inner arm has been displaced laterally twice the width of said key section.

5. A piano key and key lever comprising a key section, a center section and a tail section, and a detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections, said center section comprising two arms disposed at a large included angle to each other, said arms being of such length that when said center section is turned end-for-end and rearranged with its inner arm in alignment parallel to said key section said inner arm has been displaced laterally twice the width of said key section whereby all the keys of a piano may be formed with identical center sections and said center sections are adaptable to universal drilling of the piano balance rail.

6. A piano key and key lever comprising a key section, a center section and a tail section, each of said sections being formed of molded plastic material, and a detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections.

7. A piano key and key lever comprising a key section, a center section and a tail section, each of said sections being formed of molded plastic material, and a detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections, said center section comprising two arms disposed at a large included angle to each other.

8. A piano key and key lever comprising a key section, a center section and a tail section, each of said sections being formed of molded plastic material, and a detachable interlocking pivotal connection between said center and key sections and a detachable pivotal connection between said center and tail sections, said center section comprising two arms disposed at a large included angle to each other, said arms being of such length that when said center section is turned end-for-end and rearranged with its inner arm in alignment parallel to said key section said inner arm has been displaced laterally twice the width of said key section whereby all the keys of a piano may be formed with identical center sections and said center sections are adaptable to universal drilling of the piano balance rail.

LLOYD M. MARTIN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,505,486	Palmer	Aug. 19, 1924
2,117,002	Hammond	May 10, 1938

FOREIGN PATENTS

Number	Country	Date
261,014	Germany	Jan. 14, 1913