

[54] **KEYBOARD INSTRUMENT**  
 [76] Inventor: **Wajiha Abdel Hak**, Rue de Palestine  
 326 Zkak el Sakr, Damas-Baramke,  
 Republic of Syria  
 [22] Filed: **Mar. 21, 1974**  
 [21] Appl. No.: **453,644**

[52] **U.S. Cl.**..... **84/175; 84/451**  
 [51] **Int. Cl.<sup>2</sup>**..... **G10C 1/00; G10C 3/12**  
 [58] **Field of Search** ..... 84/451, 423, 424, 425,  
 84/433, 434, 175, 445, 446, 1.17

[56] **References Cited**  
**UNITED STATES PATENTS**  
 1,421,464 7/1922 Hans ..... 84/424  
 1,603,676 10/1926 Forster..... 84/451  
 1,775,330 9/1930 Stoehr..... 84/451 X  
 1,851,168 3/1932 Forster..... 84/451 X  
 2,266,856 12/1941 Farny..... 84/433

3,200,689 8/1965 Rosberger..... 84/451 X  
**FOREIGN PATENTS OR APPLICATIONS**  
 352,395 4/1922 Germany  
 52,629 7/1890 Germany ..... 84/424  
 326,594 2/1903 France ..... 84/451

*Primary Examiner*—Stephen J. Tomskey  
*Assistant Examiner*—John F. Gonzales  
*Attorney, Agent, or Firm*—Stevens, Davis, Miller & Mosher

[57] **ABSTRACT**  
 A keyboard instrument in which independent front and rear keyboards are provided close enough together to be played simultaneously with one hand, one of the keyboards being capable of playing octaves of 12 semi-tones and the other of playing octaves of 12 semi-tones which are a quarter of a tone sharp relative to the first mentioned octaves.

**10 Claims, 14 Drawing Figures**

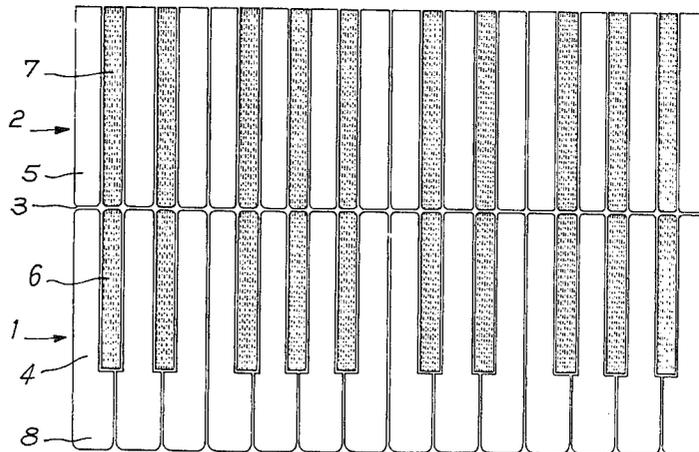
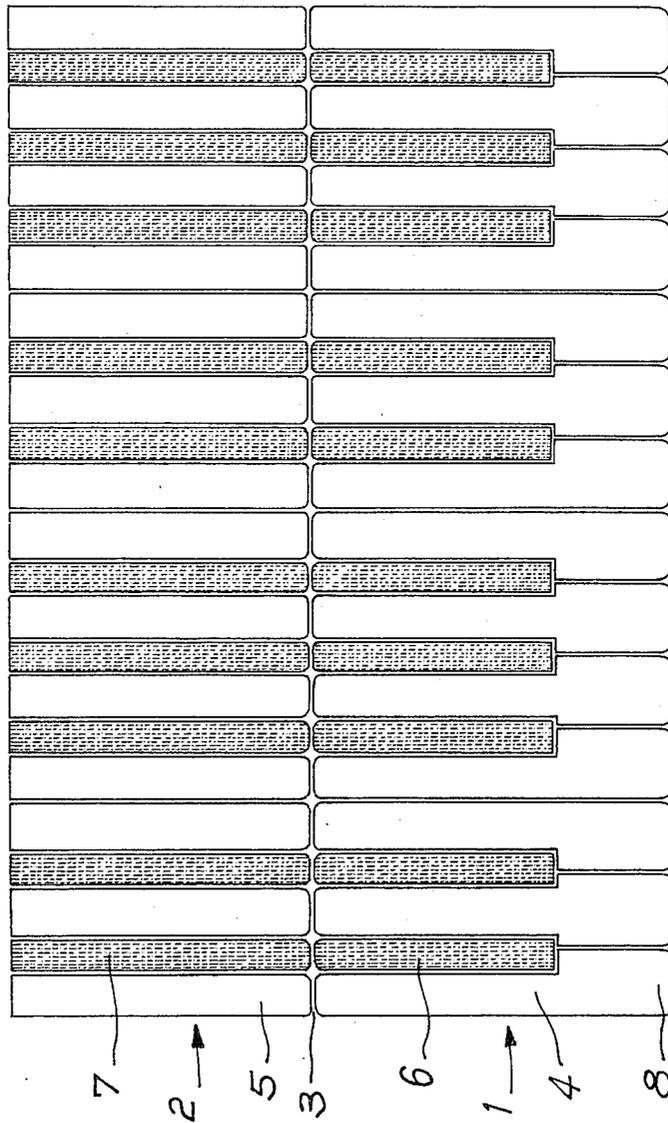
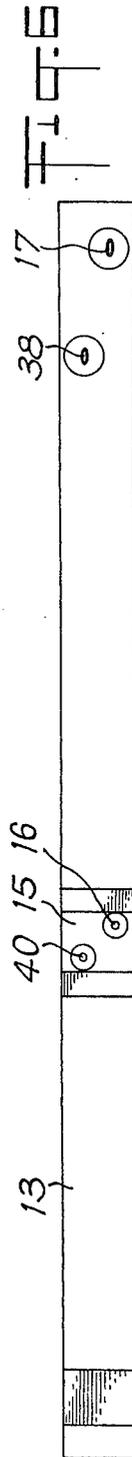
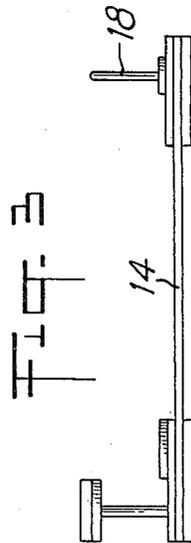
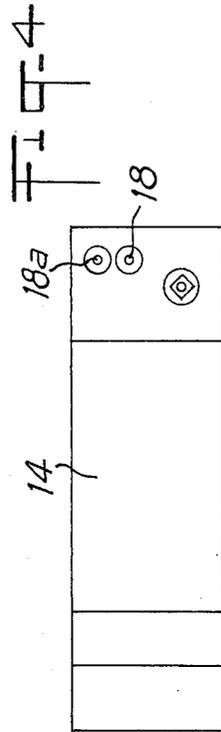
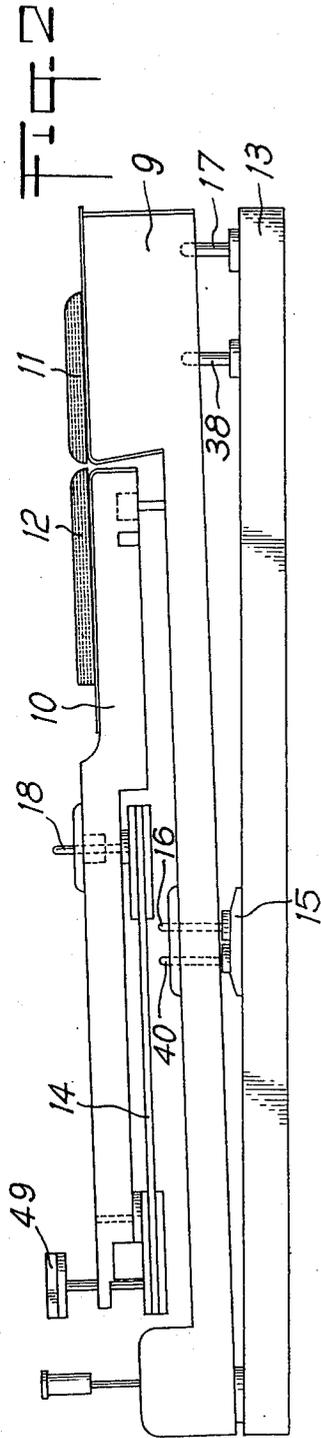
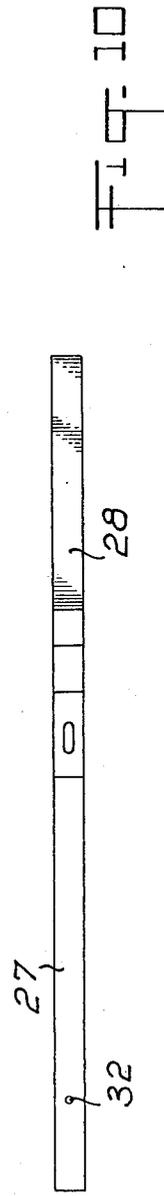
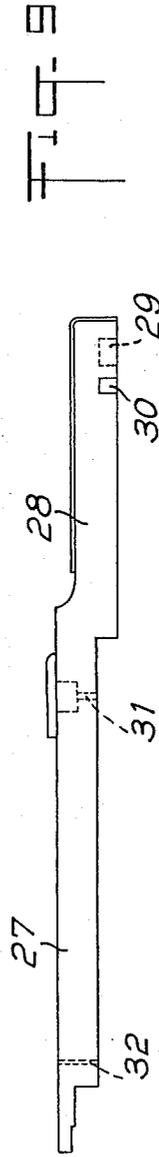
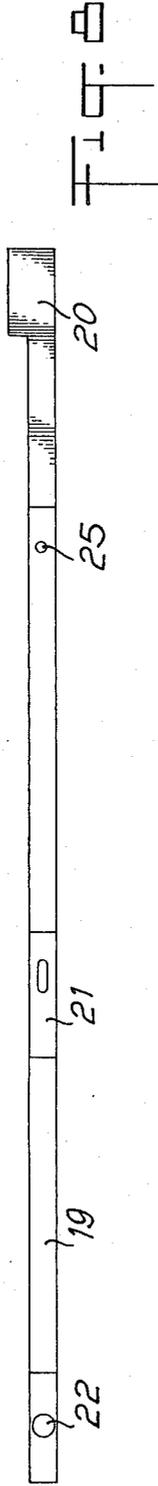
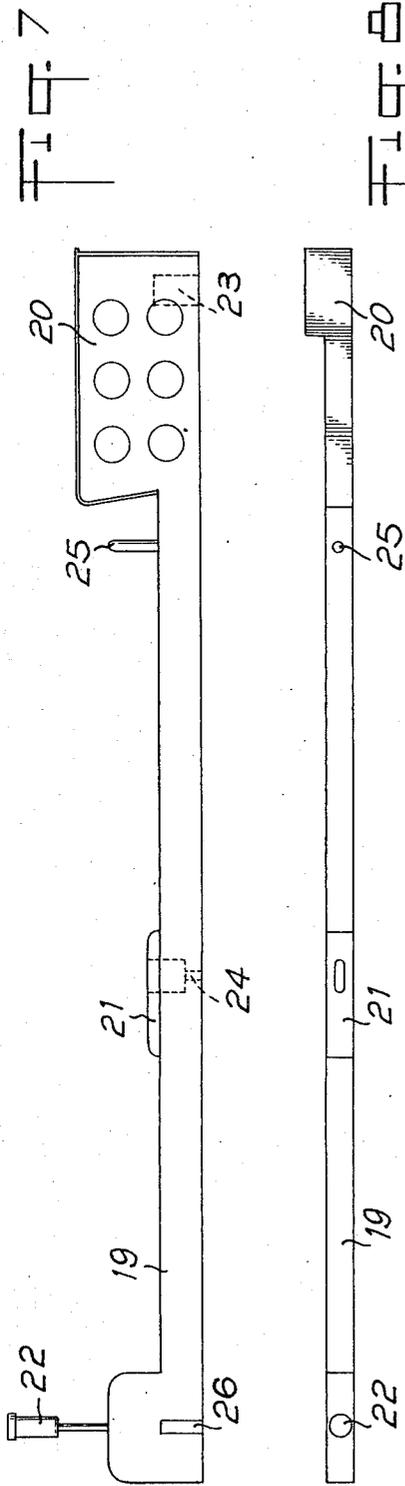
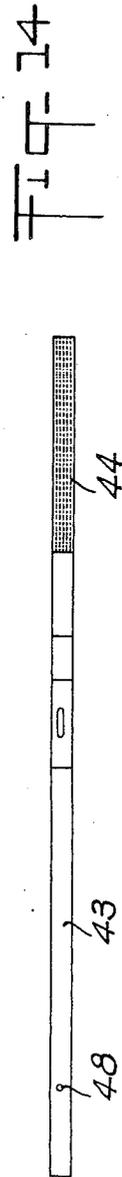
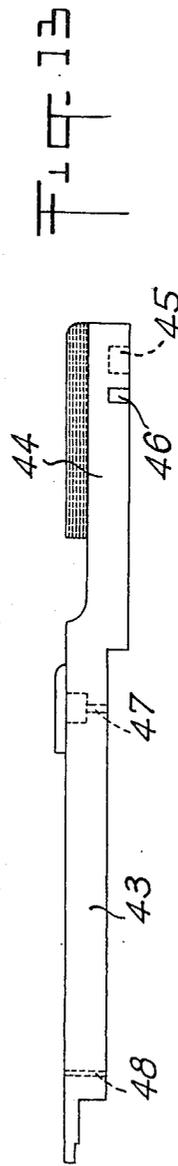
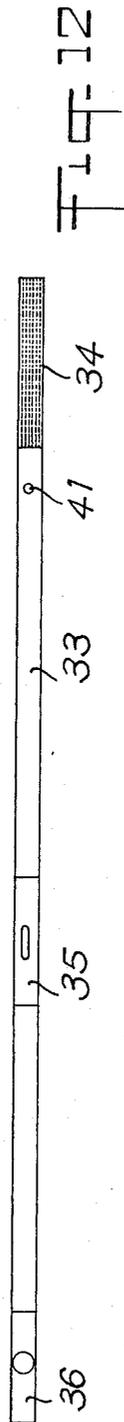
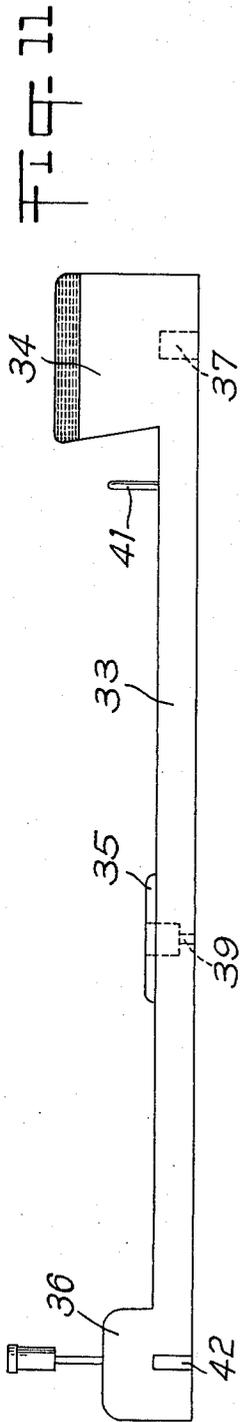


FIG. 1









## KEYBOARD INSTRUMENT

The present invention concerns an improvement to keyboards for keyboard musical instruments, notably the piano, the organ, the accordion, the melodion, the xylophone and other string instruments, wind instruments, electrical instruments and percussion instruments.

The object is to permit musicians to be able to form on these instruments occidental, oriental and arab melodies.

Hitherto several attempts have been made to realise some of these objectives but all that has been obtained was the provision of two similar keyboards, the first giving the 12 semitones and the second, positioned at the end of the first, but in an elevated position to offer twelve tones. This elevated position of the second keyboard in register with the first, and the extremities of the white keys of the second keyboard increasing the distance between the black keys of the first keyboard and those of the second, has not permitted the playing of oriental and arab melodies from the point of view of the sequence, chords and counterpoints.

Another attempt was equally made to play oriental and arab melodies with the pedals by the addition of a fourth string to the three strings provided in an occidental piano for each tone, and by the division of the assembly of strings in two categories: two of the chords producing the same note and the other two a different note. The choice between these two sounds was obtained by the pedal which displaced the hammer within the piano between the two sets of strings. Although it was possible to increase the number of notes of the piano, this process does not permit the production at the same time of a chord composed of full tones and quarter tones because of the delay necessary to displace the hammer from one position to the other.

This invention proposed for the Damas guitar can be applied to all types of keyboard instruments of all varieties, string instruments, electric instruments, wind instruments and percussion instruments.

According to the present invention there is provided a keyboard for a keyboard instrument comprising a front keyboard portion having black keys and white keys and a rear keyboard portion disposed closely adjacent the front keyboard portion with black keys and white keys which have front extremities alongside the rear edges of the keys of the front keyboard portion to enable both keyboard portions to be played simultaneously with one hand, and means for connecting the various black and white keys of the front portion to separate sound producing means which are separate from those of the rear portion.

The occidental octave is composed of twelve semitones whilst the octave utilised following the present invention is divided into 24 quarter tones which permits the musician to provide arab, oriental and occidental melodies and to retain at the same time the scales, chords and counterpoints.

The present invention permits the playing of the tones known in occidental music which are the twelve semitones, as well as the tones peculiar to oriental music and arab music namely the 24 quarter tones.

To give a clear idea of the present invention it is sufficient to consider a traditional keyboard, for example a piano keyboard, and to suppose that all the keys have been prolonged on an enlarged keyboard divided into

two parts. There is thus obtained two keyboards namely the front keyboard and the rear keyboard which may be of unequal dimensions. The rear keyboard is an extension of the front keyboard and differs from the traditional keyboard in that it does not contain the extremities of the white keys occurring in the traditional keyboard.

Following the present invention, it is not obligatory that the front keyboard be a traditional keyboard and it is possible that the front keyboard be identical in form to the rear keyboard.

Each octave of the front keyboard contains 12 notes which are the tones and semitones. Similarly each octave of the rear keyboard comprises 12 notes which are the "quarter tones" and the "three quarter tones." Thus the new musical instrument permits the provision of twenty four quarter tones so that the musician can play equally occidental music using the front keyboard and oriental music or arab music in making use of the two keyboards front and rear.

By this invention it is possible to conserve at the same time and in a simple manner all the scales, chords, polyphonics, the 12 occidental music semitones and also the 24 quarter tones of arab and oriental music.

This invention can be applied to all musical instruments using keyboards such as the piano, the harpsicord, the organ, the accordion, the melodion, the xylophone etc. Consequently all these instruments can become universal and not solely occidental.

In order that the present invention may be better understood, the following description is given merely by way of example, with reference to the accompanying drawings in which:

FIG. 1 is a top plan view of an improved keyboard according to the invention;

FIG. 2 is a side elevational view of the keyboard showing the keys of the front and rear keyboards;

FIG. 3 is a side elevational view of the second base member;

FIG. 4 is a top plan view of the second base member;

FIG. 5 is a side elevational view of the first base member;

FIG. 6 is a top plan view of the first base member;

FIG. 7 is a side elevational view of the front key (white) of a full tone;

FIG. 8 is a top plan view of the white front key of FIG. 7;

FIG. 9 is a side elevational view of the rear key (white) of a quarter tone;

FIG. 10 is a top plan view of the white rear key of FIG. 9;

FIG. 11 is a side elevational view of the front key (black) of a semitone;

FIG. 12 is a top plan view of the black front key of FIG. 11;

FIG. 13 is a side elevational view of the rear key (black) of a three quarter tone; and

FIG. 14 is a top plan view of the black rear key of FIG. 13.

In FIG. 1, there is shown the apparatus according to the invention which comprises a front keyboard 1 and a rear keyboard 2 situated at the same level and separated by a very narrow space 3.

The musical notes commencing with the note DOH, for example, for the key 4 of the front keyboard, and following in increasing sequence from DOH through a quarter tone interval to the key 5 of the rear keyboard

2, and then through a further quarter tone interval to the note DOH sharp of the key 6 of the front keyboard, and then by a further quarter tone interval to note RAY semi flat of the key 7 of the rear keyboard, and so on throughout a complete octave. The musical instruments using this invention will cover several different octaves according to the quality of the instrument and its volume.

As for the front keyboard 1, it is possible to eliminate the front extremities 8 of the white keys 4 to obtain thus a top plan view of the front keyboard 1 which is similar to that of the rear keyboard 2.

On FIG. 2, there is shown one embodiment of the invention incorporated in a piano keyboard in which each white key 9 of the front keyboard which corresponds for example to the note DOH is followed by the white key 10 of the rear keyboard which corresponds to the note DOH semi sharp i.e. a quarter tone interval higher. Following these two white keys is a black key 11 of the front keyboard corresponding to DOH sharp and the black key 12 of the rear keyboard corresponds to RAY semi flat or "DOH one and a half sharp."

The front keys 9 and 11 rest on the first base member 13 whereas the rear keys are mounted on the second base member 14.

The first base member 13 (FIGS. 5 and 6) is fixed to the body of the instrument and comprises a convex boss 15 on which are fixed metal pins 16 each of which constitutes the pivot mounting for a respective front white key 9 and pins 40 each serving as a pivot mounting for a respective front black key 11. These front keys extend back beyond the second base member 14. At the front of the first base member 13 are metal nipples 17 intended to hold each white front key 9 in its ordinary position. Equally further metal nipples 38 of the same form as the nipples 17 constrain each black front key 11 against lateral displacement. For all these reasons the base is fundamental for the front keys and it is considered equally as the pivot point for the rear base 14.

The second base member 14 (FIGS. 3 and 4) is fixed at a higher level in relation to the first base member 13. It constitutes an essential base for the rear keys 10 and 12 corresponding to the quarter and three quarter tones. At the front of this second base member 14 are fixed metal pins 18 each serving as the pivot mounting for a respective rear key 10 or 12 and it is possible with the aid of this base member to support the rear keyboard 2.

As shown in FIGS. 7 and 8, the white front keys 9 providing the entire tones (DOH, RAY, ME, FAH, SO, LAH, TE, DOH) are each composed of an arm 19 and of the key proper referenced 20 placed at the front end of the arm. A boss 21 disposed in the second half of the arm 19 is placed vertically above a boss 15 of the first base member 13. The hammer lever (not shown) located in the mechanism is of conventional form.

At the front of the arm 19 there is an orifice 23 into which penetrates the nipple 17 on the first base member 13 for preventing the key 9 from displacement laterally.

There is equally provided an orifice 24 in the arm 19 into which orifice the pivot pin 16 of the first base member 13 is engaged. A metal pin 25 fixed in the arm 19 at the front end adjacent the key 20 serves to constrain the corresponding white key of the rear keyboard 2 against lateral displacement.

At the rear of the arm 19 there is provided a balance weight 26 for the assembly to ensure that the key will rise after it has been played.

The white rear keys 10 at a tone and a quarter (FIGS. 9 and 10) comprise: an arm 27, the key proper referenced 28, and an orifice 29 which is located at the front of the key 28 to receive the pin 25 in the front white key 9.

A balance weight 30 disposed at the front of the key 28 can be selected at an appropriate value to ensure that the key will rise after it has been played. An orifice 31 is provided in the arm 27 for engagement with the pivot pin 18 of the second base member 14.

The black front keys 11 at "a tone and a half" (FIGS. 11 and 12) comprise: an arm 33 and the key proper referenced 34.

A boss 35 disposed on the arm 33 is placed vertically above the boss 15 of the first base member 13.

At the rear of the arm 33 there is provided a pusher 36 for the hammer. At the front of the arm there is provided an orifice 37 for engaging the nipple 38 of the first base member 13 to constrain the key 34 against lateral displacement. At the middle of the arm 33 is an orifice 39 to receive the pivot pin 40 of the first base member 13.

A metal pin 41 fixed to the arm 33 just behind the key 34 constrains a respective black rear key 12 from lateral displacement in the rear keyboard 2.

To balance the assembly, there is provided a balance weight 42 on the arm 33 for biasing the key to the raised position after playing.

The black rear keys 12 at "a tone and three quarters" comprise: an arm 43 and a key proper 44, and an orifice 45 in the underside of the front of the key 44 for engagement with the pin 41 of the front black key 11 at "a tone and a semi tone." A metal weight 46 situated at the front of the key 44 is of an appropriate mass to ensure that the key 44 rises after playing, and an orifice 45 receives a pin 18a (see FIG. 4) of the second base member 14.

A stop 49, disposed at a predetermined level above the extremity of the second base member 14, delimits depression movement of the arms of the keys 10 and 12 in the rear keyboard to a predetermined level.

The keyboard instrument of this invention includes a first sound producing means tunable to play a first octave of 12 semi-tones and a second sound producing means tunable to play a second octave of 12 semi-tones which is a quarter-tone sharper than the first octave. Linkage means are also provided for connecting the black and white keys of the front keyboard 1 to the first sound producing means. Additional linkage means are provided for connecting the black and white keys of the rear keyboard 2 to the second sound producing means.

It should be noted that felt pads are provided on top of the rear end of the second base member 14 and under the stop 49. It should equally be noted that the pedals conventional to an occidental piano can be provided. As for the string boards, these are well known in the piano and there will be two.

The mechanism comprises two sets of pieces fixed to the string boards and which serve as intermediary between the lever and the hammer and they are well known in the piano.

It should be understood that the person skilled in the art can make several modifications to the apparatuses and processes which have just been described solely by

way of non-limiting examples, without departing from the scope of the invention as defined by the following claims.

I claim:

1. A keyboard instrument comprising:

a front keyboard comprising black keys and white keys,

a rear keyboard comprising black keys and white keys, each key of said rear keyboard being substantially the same length as the other keys thereof,

said front and rear keyboards lying in the same substantially horizontal plane with said rear keyboard being disposed as an extension of the front keyboard so that there is only a narrow space between said front and rear keyboards,

the rear end of each key of the front keyboard being directly aligned with a respective one of the keys of the rear keyboard with the spacing between the rear end of each pair of next adjacent keys of the front keyboard being directly aligned with the spacing between a respective pair of next adjacent keys of the rear keyboard, and

each key of the rear keyboard being connected to means tunable to play a note of one quarter tone difference than that of the respective key of the front keyboard with which it is aligned whereby the common height and alignment of the front and rear keyboards permit the simultaneous playing of both keyboards with one hand.

2. A keyboard instrument as set forth in claim 1, wherein the white keys of the front keyboard are longer than the black keys thereof.

3. A keyboard instrument as set forth in claim 1, and including a first base member secured to the instrument, vertical pins carried by said first base member and means pivotally mounting the keys of the front keyboard on said vertical pins.

4. A keyboard instrument as set forth in claim 3, and including a second base member secured to the instrument, further pins extending vertically upwardly from

said second base member and means pivotally mounting the keys of the rear keyboard on said further vertical pins, said second base member being disposed above the rear portions of the keys of the front keyboard.

5. A keyboard instrument as set forth in claim 4, and further including additional vertical pins on said keys of the front keyboard and orifices provided in the keys of the rear keyboard and positioned to receive said additional vertical pins.

6. A keyboard instrument as set forth in claim 4, and including a plurality of said first and second base members, each supporting a black key and a white key.

7. A keyboard instrument as set forth in claim 1, wherein the rear end of each black key of the keys of the front keyboard is directly aligned with a respective black key of the keys of the rear keyboard; and the rear end of each white key of the keys of the front keyboard is directly aligned with a respective white key of the keys of the rear keyboard.

8. A keyboard instrument as set forth in claim 1, wherein:

each key of the rear keyboard being connected to means tunable to play a note of one quarter tone higher than that of the respective key of the front keyboard with which it is aligned.

9. A keyboard instrument as set forth in claim 1, wherein:

each key of the rear keyboard being connected to means tunable to play a note of one half tone difference than that of any key of the rear keyboard next adjacent thereto.

10. A keyboard instrument as set forth in claim 1, wherein:

each key of the front keyboard being connected to means tunable to play a note of one half tone difference than that of any key of the front keyboard next adjacent thereto.

\* \* \* \* \*

45

50

55

60

65

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 3,915,050  
DATED : October 28, 1975  
INVENTOR(S) : WAJIHA ABDUL HAK

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

[76] Inventor: Wajiha Abdul Hak, Rue de Palestine  
326 Zkak eī Sakr, Damas-Baramke,  
Republic of Syria

**Signed and Sealed this**

*twenty-seventh Day of April 1976*

[SEAL]

*Attest:*

**RUTH C. MASON**  
*Attesting Officer*

**C. MARSHALL DANN**  
*Commissioner of Patents and Trademarks*

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION

PATENT NO. : 3,915,050  
DATED : October 28, 1975  
INVENTOR(S) : WAJIHA ABDUL HAK

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

[76] Inventor: Wajiha Abdul Hak, Rue de Palestine  
326 Zkak eī Sakr, Damas-Baramke,  
Republic of Syria

Signed and Sealed this

twenty-seventh Day of April 1976

[SEAL]

Attest:

RUTH C. MASON  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents and Trademarks