Sept. 23, 1952

O. HEIM

2,611,291

KEYBOARD

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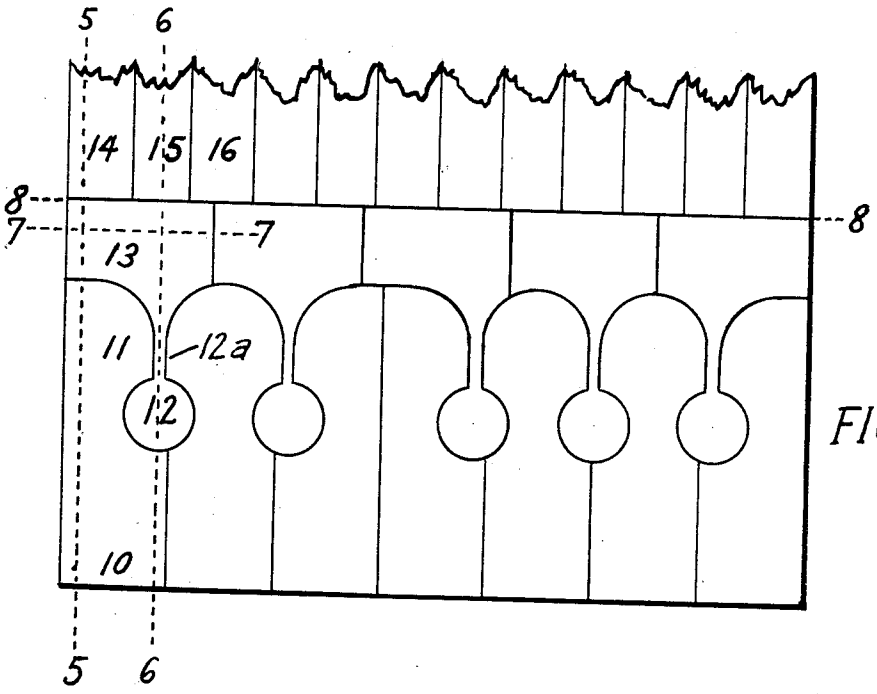


FIG. 1

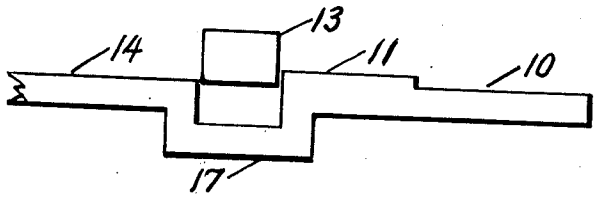


FIG. 2

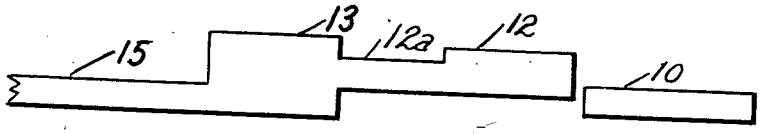


FIG. 3

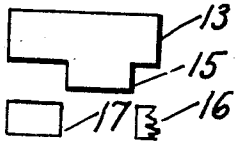


FIG. 4

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KEYBOARD

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10 Claims. (Cl. 84—427)

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The standard keyboard of today is over three hundred years old and susceptible to much improvement. The improvement here described differs from other attempts with the same purpose in that the pianist is not required to relearn—or the manufacturer to re-design the piano or the so-called action (the totality of the key and hammer mechanism consisting of about 75 pieces).

This invention relates to keyboards adapted for use in musical instruments, as for instance the piano and the accordion, or the like.

More particularly the present invention contemplates means for facilitating or improving fingering techniques on the part of the musician, without sacrificing the skill previously acquired on the standard keyboard. That is to say, a new arrangement and construction of keys is here proposed, for the purpose and object of eliminating or simplifying certain fingering problems of the piano or other musical instruments employing keyboards, wherein the ability or skill possessed by the player on the conventional instrument may be applied to the keyboard herein disclosed, as will be apparent.

The keyboard now in general usage and very well known is that developed by Cristofori three centuries ago. Other keyboards have been introduced since, such as those of Meyer, Janko and Reuther, but none has found the same acceptance, popularity and widespread usage as the earlier Cristofori board. For the old keyboard has manifest advantages over the later ones; but it also has certain disadvantages or shortcomings, which limit or restrict the freedom of manipulation of the player's fingers, with consequent hindrance to an individual's full development of the art of playing.

Perhaps it would be more accurate to say that at least in part, the fingering difficulties commonly met by the artist are due also to the natural construction and arrangement of the human hands and fingers which, marvelous though they are, are not perfectly adapted to use of the Cristofori board, principally because of variations of length and thickness. For instance, very often the score or composition to be played requires the pianist to reach into the space or spaces between two black keys of the conventional keyboard, as for example in striking or sounding the four note chord (E flat, G, A, E flat). To do so, the artist is required to depress the two E flat notes, which are black keys, with the thumb and smallest finger. This necessarily places the playing hand in what may be termed for convenience the back

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position, that is, substantially distant from the ends of the white keys of the board and from the body of the player. Thus, to strike the white keys in the said chord namely, the notes G natural and A natural, the musician must reach into the white spaces, between the black keys G flat, A flat and B flat. It is impossible to do otherwise, since the human hand is constructed as it is, and the player simply cannot simultaneously strike the notes E flat, E flat in the so-called back position, and the notes G and A in the front position, or portions of the white keys nearest the body of the keyboard manipulator.

Moreover as is known, the chromatic scale or semitone scale, which comprises twelve consecutive notes, is played only with two and three proximate or adjacent fingers, according to accepted keyboard technique, as for example, with the thumb and index fingers, or thumb, index and middle fingers, thus T I or T I M. For instance, on the Cristofori keyboard, if one starts by striking the note C with the thumb, the fingering is as follows: T I, T I, T I M, etc. With the present novel keyboard, however, all five fingers may be employed, according to either of two schemes, viz: (1) T I M R, T I M, etc., where R is used as a symbol for the fourth finger of the hand, and (2) T I M R, T I M R S, T I M R S, T I M R S, T I M R, etc., where S denotes the short or small finger.

A further object of the present invention is to facilitate and extend thumb technique; for with the new keyboard hereinafter disclosed, as will be understood, the arrangement of keys is such that improved and more conveniently accessible positions and fingering techniques are made available to the artist. Another object is to provide alternative striking or landing areas on different portions of the same keys, to suit the convenience of the musician having due regard to the score of the particular work or composition to be played. With the above and other objects in view, as will be apparent, the present invention consists in the construction, combination and arrangement of parts hereinafter described at length and illustrated in the several views of the accompanying drawings, wherein

Fig. 1 is a plan view of one embodiment of the novel keyboard, wherein a preferred relative arrangement of the black and white keys of one octave is shown;

Fig. 2 is a sectional view taken along the dotted vertical line 5—5 of Fig. 1, to show the design or construction of the white keys.

Fig. 3 is a similar section, along the adjacent

line 6—6 of Fig. 1, illustrating the structure of the black keys; and

Fig. 4 represents a lateral cross section taken along the dotted line 7—7 of Fig. 1, to indicate the relative arrangement of both the white and black keys, at the back or rearward portion of the keyboard.

The keyboard arrangement and construction here proposed, contemplates a plurality of landing or striking areas in stepped or ascending relation, for each key on the board, both black and white, whereby the artist may strike any note from at least two different positions or planes, here termed for convenience, the front and black positions. Moreover, according to a preferred embodiment, the order of ascent or steps contemplates that both landing areas of each of the white keys lie in planes below the level of the landing areas of all the black keys. It is also proposed that the front positions or portions of all the keys, black and white, should lie in planes below the planes of the back portions thereof. If desired, the front and back portions of the several keys may be in two or more parts fastened together, but the preferred practice is to fabricate all portions of each key as an integral unit. It is further contemplated that the order of ascent, as described, shall be common to all keys on the board, so that every white key is provided with two separate and distinct landing levels, wherein the amount of the ascent is the same or substantially the same for all white keys. Similarly all the black keys are provided with two landing area levels in stepped relationship, both lying in planes above the plane of the upper level of the white keys, the degree or height of the steps between the levels of every black key being substantially the same.

Thus, the present improvements provide keyboard means for extending or enlarging the virtuosity of the artist, comprising a plurality of landing areas lying in ascending horizontal planes, for each note on the board, and further characterized in that the lower landing portions of the black keys lie in a common plane above the common plane of the upper landing portions of the white keys.

As illustrated in the drawings, it will be noted that each of the white keys includes a horizontal front landing area 10 lying in a plane common to the plane of the other white keys, and a similarly constructed parallel co-acting back portion 11 lying in a plane above the plane of the front portion 10; so as to be in stepped ascendent relation therewith as shown in Fig. 2.

In similar fashion, as indicated in Fig. 1, each black key of the present invention may comprise the ascending steps 12 and 13 lying in different horizontal planes above the planes of the white keys, with the front portion 12 of each black key lying below the level of the back portion or landing area 13. Thus the present keyboard provides a plurality of regularly and successively ascending landing areas or front and back positions for all the white keys 10, 11 and all the black keys, 12, 13 on the board.

As seen in Fig. 1, the front portions 12 of the black keys may, if desired, be circularly designed and fixed to or made integral with the back portions 13 by means of a narrowed intermediate portion 12a.

Connecting parts (12a) of black keys are kept preferably below the level of plane 11 in the vertical dimension, so that the fingers cannot reach them.

On the other hand, the back portions of positions 13 may for convenience be made at least substantially as wide as the white keys 10, 11. These are matters of choice in practice, it being considered that the difficulties of technique previously discussed are brought about not so much from lack of space between the white and black keys, but more likely from the fixed relationship of the white and black components in conventional keyboards which do not provide any alternative playing positions. The present invention, as shown, does provide such alternatives, so that, as in the violin, the notes of the score may be played in more than one position.

With further reference to the drawings, all elements above the horizontal dotted line 8—8 in Fig. 1, such as the key extensions 14, 15 and 16, are of conventional structure and dimensions and per se form no part of the present invention. These extensions 14, 15, 16, all lie in the same plane and are contiguous to or adjacent each other as in the conventional keyboard. Moreover, only one octave is illustrated in Fig. 1, as it will be understood that the remainder of the keyboard is of a like arrangement and assembly.

To prevent the black keys 12, 13, from sounding the notes of the white keys 10, 11, when the former are depressed a U-shaped connecting portion 17 may be provided so as to make a free space available between the landing areas 10, 11 and their co-acting extension piece 14.

The terms "white keys" and "black keys" as used above and hereinafter claimed, are intended to designate respectively the keys employed to sound natural notes and to strike flats and sharps; in accordance with present day practice and understanding.

It will be undertsood of course, that if desired, keys of standard construction may be incorporated in a keyboard made according to the present invention, but this is not preferred as nothing is gained thereby from the standpoint of improving fingering technique.

Moreover, although the present keyboard is intended primarily as a useful means for improving the skill of the musician, it may also be employed in other fields, as for example as a toy or otherwise.

In the light of the foregoing description of one embodiment of this invention, what is claimed is:

1. The combination in a keyboard of the character described, of a plurality of adjacent and parallel black and white keys, each key having portions lying in more than one plane and all of the planes of the black keys being above all of the planes of the white keys.

2. Keyboard according to claim 1, further characterized in that the front portions of the white keys lie in a common plane below the plane of the back portions of the white keys.

3. Keyboard according to claim 1 further characterized in that the back portions of the black keys lie in a common plane above the plane of the front portions of the black keys.

4. Keyboard according to claim 1 further characterized in that the front portions of the black keys lie in a common plane below the plane of the back portions of the black keys, and the back portions of the white keys lie in a common plane above the plane of the front portions of the white keys.

5. Keyboard according to claim 1, wherein the front portions of the black keys are of a

common width less than the width of the back portions of the white keys.

6. Keyboard according to claim 1, wherein the back portions of the black keys are of a common width at least substantially as wide as the width of the front portions of the white keys.

7. Keyboard according to claim 1, further characterized in that the back portions of the black keys are substantially as wide as the front portions of the white keys and the front portions of the black keys are narrower than the width of the white keys.

8. A keyboard with a row of black keys having constricted portions and a row of white keys also having constricted portions wherein the front portions of the white keys are contiguously side by side, and wherein the back portions of the black keys are substantially side by side; further, wherein the front portions of the black keys are side by side with the constricted portions of the white keys, and wherein the rear portions of the white keys are side by side with the constricted portions of the black keys.

9. A keyboard in which the black keys are essentially disposed and arranged as in a standard keyboard, with each black key being constricted to a relatively small fraction of its width near its anterior end and each white key constricted near its posterior end; the voids left by the constrictions in keys of one color being occupied by parts of keys of the other color.

10. Keyboard according to claim 8, further characterized in that the constricted portions of the black keys lie in a plane below the plane of the constricted portions of the white keys.

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