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2,684,006

PRACTICE KEYBOARD

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Fig. 1.

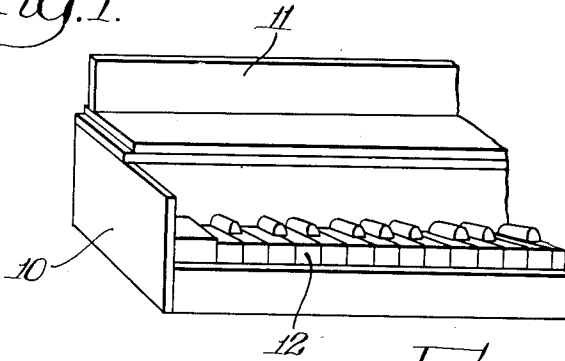


Fig. 6.

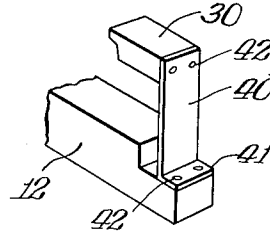


Fig. 2.

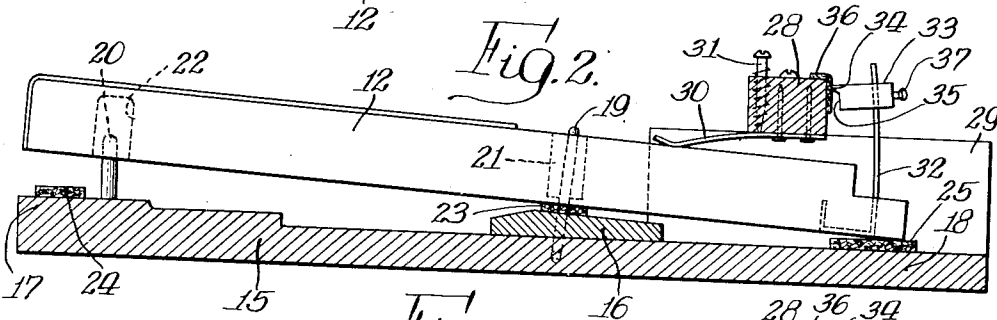


Fig. 3.

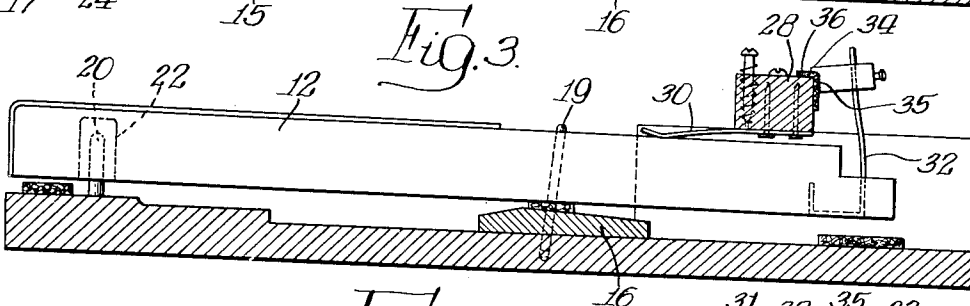


Fig. 4.

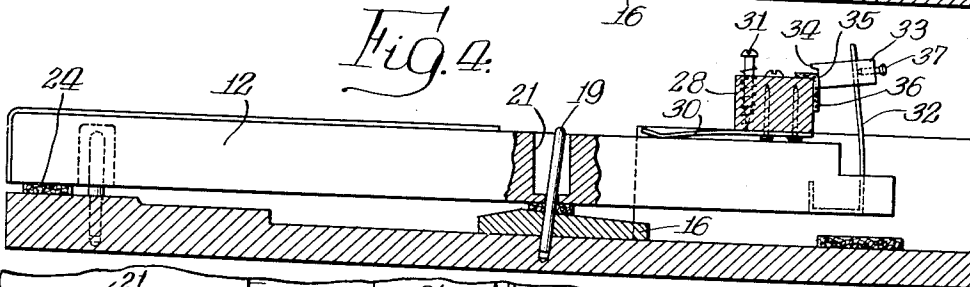
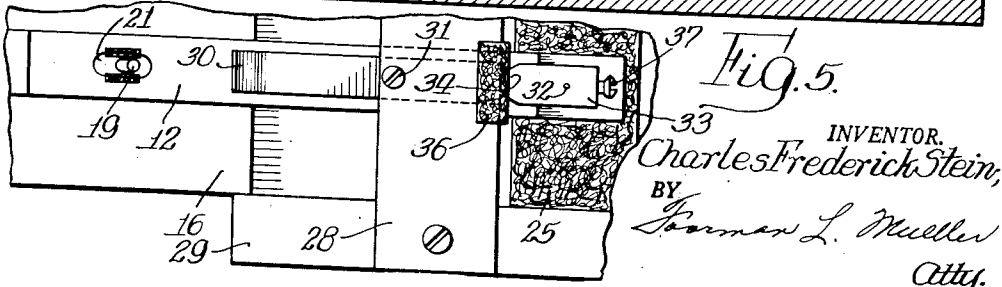


Fig. 5.



UNITED STATES PATENT OFFICE

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PRACTICE KEYBOARD

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6 Claims. (Cl. 84-467)

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This invention generally relates to practice keyboards, and more particularly to a practice keyboard of simple construction which provides the same feel to the person playing as the keyboard of a true piano.

There are many instances in which there is a need for a practice keyboard which can be used by a person learning to play the piano, or by an accomplished musician to practice playing, without making the usual sound. In addition to cases in which it is desirable to eliminate the sound, there are other instances in which it is desired to practice where there is not sufficient room for a complete piano, or in which a practice instrument which is much less expensive than a real piano is desired. Although such instruments have been provided in the past, these instruments have not been successful in that they have not provided the same touch or feel as a real piano. Therefore practice with such a keyboard was of little value in developing technique which would be of value in actually playing a piano. Further, the practice keyboards which are available and in which an attempt has been made to provide the true piano feel have been relatively complicated and have therefore been expensive. Also, such practice keyboards have required critical adjustment which renders the same impractical since it is desired that these instruments be used by children or other inexperienced persons.

One of the reasons why the development of a practice keyboard has been difficult is that in a real piano action thereof is a letoff at one point of movement which permits the hammer to move freely to strike the string. Although various attempts have been made to provide a similar characteristic in a practice keyboard, the prior devices have not provided this same letoff feel as a real piano.

It is therefore an object of the present invention to provide an improved practice keyboard which has the same feel as a true piano.

A further object of this invention is to provide a practice keyboard in which the tension of the key is released at one point during movement thereof, so that the feel produced is the same as that of a true piano.

A still further object of this invention is to provide a practice keyboard having a true piano feel and which is of a construction which may be adapted to production manufacture so that the keyboard may be inexpensively produced.

A feature of this invention is the provision of a practice keyboard in which the keys are mount-

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ed in the same manner as in a true piano, with means at the rear thereof for holding the key in the normal position and providing tension thereon, which means includes an offset portion providing a letoff to reduce the tension on the key just before it completes its downward movement.

A further feature of this invention is the provision of a practice keyboard including keys mounted on a rail structure with an upper rail above the back of the keys having a spring engaging each key and a second spring secured to the rear end of the key, with the spring at the rear of the key having a head thereon engaging the upper rail, which head has an offset portion so that as the back end of the key is raised the offset portion releases the tension of the back spring to provide a letoff resembling the true piano feel. Means may be provided for adjusting the tension of the spring engaging the key to thereby change the feel of the key as may be desired.

Further objects, features and the attending advantages of the invention will be apparent from a consideration of the following description when taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a portion of a practice keyboard in accordance with the invention;

Figs. 2, 3 and 4 are cross sectional views of the practice keyboard showing a key in different positions;

Fig. 5 is a top view showing the structure for controlling the movement of the key; and

Fig. 6 is a perspective view showing a second embodiment of the rear spring and head structure of the unit.

In practicing the invention there is provided a practice keyboard including keys which may be generally similar to the keys in a piano. The keys may be supported in the same manner as in a piano with a balance rail at the center thereof and front and back rails engaged by the front and back ends of the keys respectively when in the different positions. Over the back portion of the key is an upper spring rail and means for interconnecting this rail and the rear end of the key to impart thereto the same feel as that of a true piano action. This means includes a spring connected to the upper rail and engaging the key for holding it in the normal position with the front end thereof raised. An adjustable screw may be provided for imparting the desired tension to this spring. A second spring is con-

nected to the rear end of the key and includes a head thereon which engages a portion of the upper rail. This head has a projecting portion and an offset portion with the projecting portion engaging the back of the upper rail when the key is in position to be played. As the front end of the key is depressed and the back end raised, the projecting portion slides along the back end of the key until it clears the top thereof. At this point a letoff action takes place permitting the key to be moved against the tension of the upper spring only until the offset portion of the head engages the upper rail. The key may then be further depressed until the front engages the front rail.

Referring now to the drawings, in Fig. 1 there is illustrated the practice keyboard of the invention in a case 10 having a pivoted cover portion 11 which may be turned back to expose the keys 12. This may be generally like the folding front of a real piano. As illustrated in Figs. 2, 3, and 4 the keys 12 are supported on a frame structure which includes a bottom plate 15 having a balance rail portion 16 and front and back rail portions 17 and 18 extending crosswise thereof. The balance rail portion 16 and the front rail portion 17 are provided with pins 19 and 20 and openings 21 and 22 are provided in the key 12 for receiving the pins 19 and 20 respectively, in a well-known manner. Pads made of felt or other suitable material are provided on each of the rails as indicated at 23, 24 and 25.

For holding the keys 12 with the front end in the normal raised position for playing, there is provided a structure cooperating with the back portions of the keys 12 including an upper spring rail 28 which may be supported on blocks 29 at the ends of the keyboard. Secured to the rail 28 are springs 30 which bear against the top surfaces of the back parts of the keys 12. The springs 30 therefore tend to hold the back parts of the keys depressed so that the front parts thereof are raised. Screws 31 permit adjustment of tension of the springs 30 with respect to the back parts of the keys 12. Secured to the back end of each key 12 is a letoff spring structure including a second spring 32 which extends upwardly therefrom and a head 33 secured thereto having a face which bears against the upper rail 28. The face of the head 33 which engages the rail 28 includes a projecting portion 34 and an offset portion 35. The head is adapted to engage a felt covering 36 on the upper spring rail 28. The head 33 may be adjustably secured to the spring 32, which may be in the form of a wire, by a screw 37 threaded into the head 33 and engaging the spring 32.

Considering now the operation of a key 12, reference is made to Figures 2, 3 and 4 which show the key in three different positions. Fig. 2 shows the key in a normal position to be operated with the rear end thereof held against the back rail felt 25 by the action of the spring 30. It is noted that the projection 34 of the head 33 engages the felt 36 on the spring rail 28 when the key is in this position. Fig. 3 shows the key when it has been depressed so that the projection 34 is moved to a position above the spring rail 28 and no longer engages this rail. Fig. 3 shows in dotted lines the position of the head just as it clears the rail and in solid lines the position of the head after it has cleared the rail so that the offset portion 35 engages the felt 25. It will be apparent that as the key reaches the position such that the projecting portion clears the top

of the felt 36, the friction of the projecting portion 34 against the felt 36 will immediately be released. This will provide a letoff feel similar to the letoff which takes place in a standard piano action. Thereafter the offset portion 35 will engage the felt 36 to provide resistance to further movement of the key which is known as the after touch. Fig. 4 then shows the position of the key when it has been completely depressed so that the front end thereof engages the front felt 24. In this position the offset portion 35 of the head 33 has been moved along the felt 36 as is shown in Fig. 4.

It is therefore seen that the downward movement or playing action of the key goes through three separate stages, the first while the projection 34 engages the felt 36 to provide the original touch, the second as the projection 34 drops off the felt 36 to provide the letoff, and the third as the head 35 moves farther up until the key engages the front felt to form the after touch. The feel of these three stages is very much like that encountered in the movement of a true piano action and therefore practice on the practice keyboard provides substantially the same feel as with a true piano. The tension of the keys may be adjusted by the screws 31 so that the force required for operating the keys may be controlled as desired. Therefore, the unit is very helpful to permit practice of piano technique without producing any sound.

In Fig. 6 there is illustrated a second embodiment of the spring construction which may be used in the combination illustrated in Figs. 1 to 5 inclusive. In this structure the wire spring 32 has been replaced by flat spring 40. The flat spring has an angular portion 41 at the bottom adapted to be secured to the top surface of the rear end of the key 12. The head 33 which engages the spring rail 23 is secured at the top of the flat spring 40 by a suitable means such as nails or screws 42. The angular portion 41 may be similarly fastened to the rear end of the key 12.

The practice keyboard may include any number of keys as desired from a few octaves which may be helpful to a beginner to a full piano keyboard of 88 notes. As previously stated, the keys provide a true piano feel which includes the original touch, the letoff and the aftertouch. The letoff action is very much like that of a true piano action and renders the keyboard highly successful as a practice instrument so that the person playing may develop techniques which can be used on a true piano.

As is apparent from the drawings, the structure of the practice keyboard is relatively simple and can be manufactured inexpensively. The various components are similar to components customarily used in piano actions and therefore are well within the province of workmen in the art. The instrument is small so that it is adapted for use in classes wherein a large number of instruments might be provided in the same room. Further, there is substantially no sound so that the keyboard can be used in many places where sound would be objectionable.

Although certain embodiments of the invention have been disclosed which are illustrative thereof, it is obvious that various changes and modifications can be made therein without departing from the intended scope of the invention as defined in the appended claims.

I claim:

1. A piano practice keyboard including in combination a frame structure having a balance rail

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portion and front and back rail portions, an elongated key supported on said frame structure having front, center and back portions, with said center portion supported on said balance rail and said key being movable from a normal position in which said back portion thereof engages said back rail portion to an actuated position in which said front portion thereof engages said front rail portion, a spring rail positioned above said back portion of said key, and tension means interconnecting said spring rail and said back portion of said key which tends to hold the same in said normal position, said spring rail, said tension means and said back portion of said key having interengaging parts one of which includes an offset portion which is engaged just before said front portion of said key reaches said front rail portion to at least partially release said tension on said key.

2. A piano practice keyboard including in combination a frame structure having a balance rail portion and front and back rail portions, an elongated key supported on said frame structure having front, center and back portions, with said center portion supported on said balance rail and said key being movable from a first position in which said back portion thereof engages said back rail portion to a second position in which said front portion thereof engages said front rail portion, a spring rail positioned above said back portion of said key, and means including a spring portion interconnecting said spring rail and said back portion of said key and providing tension on said back portion of said key which tends to hold the same in said first position, one of said means and said back portion of said key having an offset portion engaged just before said front end of said key reaches said front rail portion to at least partially release said tension on said key.

3. In a piano practice keyboard including rail means and elongated keys supported thereon for movement from a first position in which the front part of the key is raised and the back part thereof is depressed to a second position in which the front part is depressed and the back part is raised, the structure for controlling movement of a key so that the feel of the movement thereof is substantially the same as that of a true piano including in combination, spring rail means positioned above the key, a first spring supported on said rail means and engaging said back part of the key and tending to hold the same in depressed position, a second spring secured to the back part of the key and extending upwardly therefrom, and a head on said second spring having a side toward said spring rail means with a projecting portion and an offset portion, said projecting portion engaging said spring rail means when said key is in said first position and being moved to a position above said rail means as said key moves toward said second position so that said projecting portion is released from said rail means and the tension on said key is reduced.

4. In a piano practice keyboard including rail means and elongated keys supported thereon for movement from a first position in which the front part of the key is raised and the back part thereof is depressed to a second position in which the front part is depressed and the back part is raised, the structure for controlling movement of a key so that the feel thereof is substantially the same as that of a true piano including in combination, spring rail means above the back part of the key, first spring means supported on said rail means and engaging said back part of the key and tending to hold the same in depressed position, adjustable tension means for said first spring means, second spring means secured to the back end of the key and extending upwardly therefrom, and a head on said second spring having a face toward said spring rail means with a projecting portion and an offset portion thereon, said projecting portion of said head engaging said rail means when the key is in said first position and being moved to a position above said rail means as the key moves toward said second position so that said projecting portion is released from said rail means and the tension on said key is reduced, said offset portion of said head engaging said spring rail means after said projecting portion is moved above said spring rail means.

5. In a piano practice keyboard including rail means and elongated keys supported thereon for movement from a first position in which the front part of the key is raised and the back part thereof is depressed to a second position in which the front part is depressed and the back part is raised, the structure for controlling movement of a key so that the feel of the movement thereof is substantially the same as that of a true piano including in combination, spring rail means above said back part of the key, a first spring supported on said rail means and engaging said back part of the key and tending to hold the same in depressed position, and second spring means secured to the back end of said key and extending upwardly therefrom, said second spring means having a projecting portion extending toward said spring rail means, said projecting portion engaging said spring rail means when the key is in said first position and being moved to a position above said spring rail means as the key moves toward said second position so that said projecting portion is released from said spring rail means and the tension on said key is reduced.

6. A structure in accordance with claim 3 wherein said second spring is formed of flat spring material and has an angular portion secured on the top surface of the back part of said key and an upwardly extending portion, and said head is secured to the top of said upwardly extending portion.

No references cited.