April 16, 1957 S. T. WICKSTROM 2,788,698

PRACTICE PIANO

Filed June 17, 1954

Fig. 1

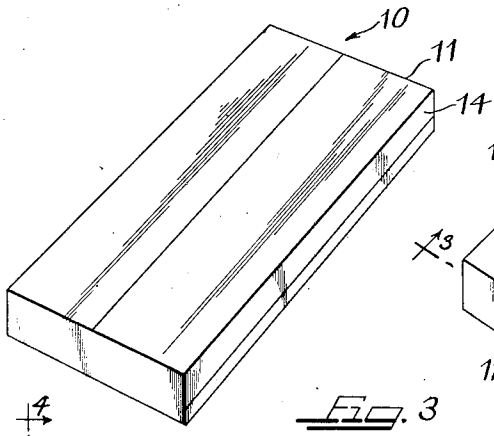


Fig. 2

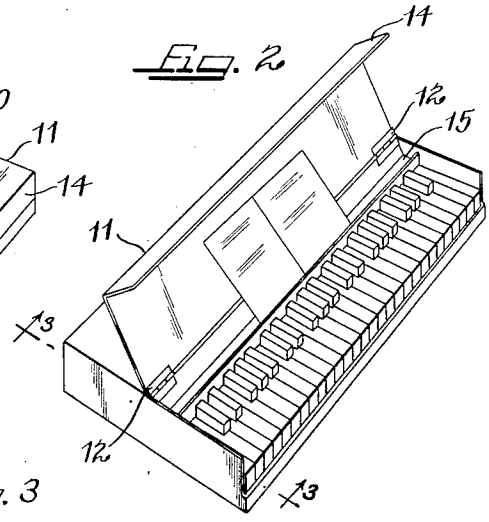


Fig. 3

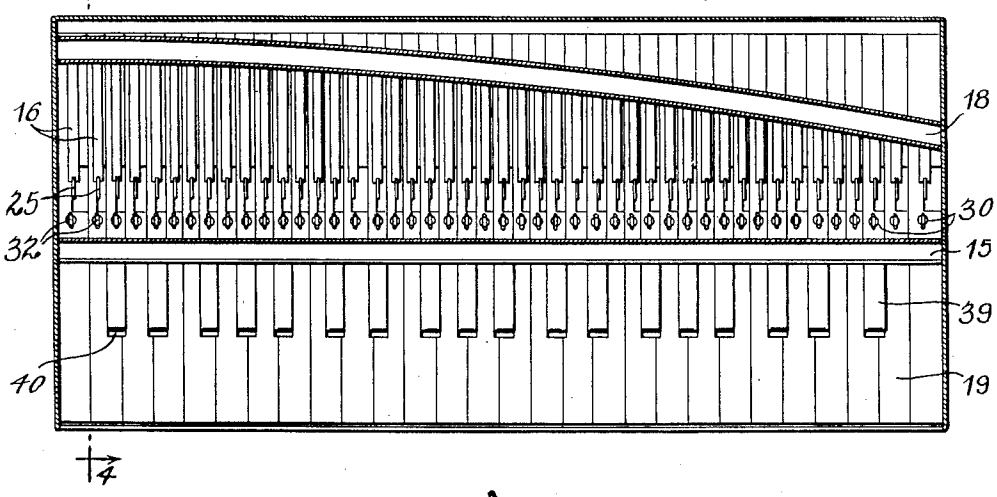
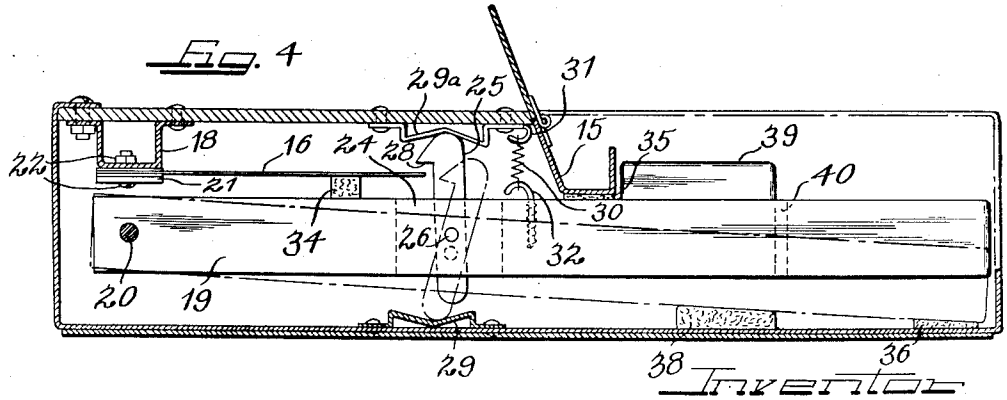


Fig. 4



Inventor

SVANTE T. WICKSTROM

By: Carlson, Pitzner, Hubbard & Wolfe

Attys.

United States Patent Office 2,788,698
Patented Apr. 16, 1957

2,788,698

PRACTICE PIANO

Svante T. Wickstrom, Skokie, Ill., assignor to R. Elizabeth Craton, Marshall, Mo.

Application June 17, 1954, Serial No. 437,379

6 Claims. (Cl. 84—408)

The present invention relates in general to smaller type practice pianos. More particularly the invention relates to such miniature pianos which rely for their tonal quality on the picking of a plurality of tuned reeds. Although the principal utility of the invention may be as a practice piano, the invention actually contemplates an entire musical instrument.

There has long been a need for a small piano which is portable, inexpensive, and yet faithfully duplicates the movement of a larger conventional piano. Many attempts have been made at eliminating the harp or stringed portion of a piano by replacing it with various length vibrating reeds, which are picked responsive to the player's depressing a key. However, the reeds have been picked by ratchet-like affairs which do not duplicate the tone-holding or tone-dampening effect which the conventional piano affords. Also, small children's pianos have been made in which a crude keyboard is connected with hammers for striking metal plates, but again, provision for duplicating the tonal shadings such as afforded in a conventional piano is lacking.

It is the principal object of this invention to afford a miniature practice piano which will faithfully duplicate the touch of a conventional piano and yet small enough to be fully portable.

An additional object of this invention contemplates a piano movement intended for picking a reed in a miniature practice piano which will duplicate the touch and feel of a full-size piano.

A further object of the invention lies in the construction of a piano movement which is standardized for every key and requires a minimum of parts, thereby rendering fabrication inexpensive and keeping maintenance at an irreducible minimum.

Further objects and advantages of the invention will become apparent as the following description proceeds, taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a miniature piano box exemplifying the present invention.

Fig. 2 is the same perspective view as Fig. 1, but the piano box has been opened to the playing position.

Fig. 3 is a plan view taken in partial section displaying the keyboard and internal portion of a piano exemplifying the invention.

Fig. 4 is a cross-sectional view illustrating the movement of a particular key in a piano exemplifying the invention.

Although the particular embodiment of the invention has been shown and will be described in some detail here, there is no intention to thereby limit the invention to such details of embodiment. On the contrary, the intention is to cover all modifications, alternative embodiments, usages and equivalents of the piano as fall within the spirit and scope of the invention as expressed and defined in the specification and appended claims.

In the present instance the piano contemplated by the invention is illustrated in a rectangular-shaped housing

10 as shown in Fig. 1. Referring now to the relationship between Figs. 1 and 2, it will be seen that the lid 11 hinges by means of hinges 12 for opening to a position where the frontal skirt 14 of the lid 11 becomes the top of a music rack. In addition a music rack base 15 extends below the housing lid hinges 12 in a modified J-shape, thereby holding the music in place. Although it is contemplated that a carrying handle might be attached to the case, a lock provided for the lid 11, and an optional stand upon which the piano may be mounted, such modifications are not pertinent to the present invention and therefore have not been disclosed in the drawings nor will they be described herein.

Referring now to Fig. 3, the upper portion of which discloses the tonal portion of the piano, it will be readily seen that this construction very faithfully duplicates that of a full-size piano. The keyboard is arranged in a similar fashion, the particular keyboard illustrated contemplating approximately four octaves. Naturally the range and number of keys, and correspondingly the number of octaves, can be varied in accordance with the dictates of the particular manufacturer. The actual tonal qualities are derived from the picking of a plurality of vibrating reeds 16 which are mounted securely at their fixed end and to the tone beam 18. The tone beam 18 has been illustrated here as a channel-shaped curve beam of metal which is fastened to the upper inner portion of the housing 10. It will be appreciated, of course, that the configuration of the tone beam 18 as well as the lengths of the reeds 16 will vary in accordance with many factors which enter into the preselection of the reeds. For example, a thicker reed would require a greater length to vibrate at the same frequency as a thinner reed. It is contemplated that the individual manufacturers would vary considerably in their selection of the varying factors which make up the tone chamber of the piano.

Referring now in greater detail to Fig. 4, it will be seen that the movement of a typical key has been greatly simplified from that of a conventional piano. The key 19 is pivotally mounted at its far end adjacent the tone beam 18 on key pivot bar 20. Since the key will, in normal operation, be depressed at its extreme end from the key pivot bar 20, and the reed 16 will be picked at a point between the pivot point and a point at which the player's force is applied to the key, the key 19 operates as a second-class lever.

Referring now to the vibrating reed itself, it will be seen that it is mounted in cantilever fashion, from the tone beam 18 extending toward the music rack base 15. Best results are achieved when all of the reeds terminate at a point equidistant from the front or rear of the housing, although this is not essential. The reeds 16 are secured to the tone beam 18 by means of an overlay strip 21 and bolts 22.

The key, as described above, is a second-class lever. In the central portion of each key 19 a slot 24 is provided in which a pick 25 is pivotally mounted with a pick pivot pin 26. The pick is rounded at both ends, having an overlapping shoulder 28 at its forward portion positioned for a partial overlying relationship with the end of the vibrating reed 16.

As the key 19 is depressed it pivots about the pivot rod 20 and the shoulder 28 of the pick 25 engages the reed. But as the travel of the key is relatively short, the pick will not necessarily disengage itself from the reed 16 and thereby release it for vibration.

Also the pick 25 must be returned to its normal operating position when the key is released by the player. Accordingly, a coacting pair of offset pick stops 29 and 29a have been provided for mounting above and below the pick 25, but affixed to the housing 10. It will be noted that the stops are made in the shape of a modified M.

although any construction providing a basic V-trough into which the rounded end of the pick 25 can be deflected would suffice. The bottom pick stop 29 is offset slightly back of the top pick stop 29*a* to insure a retraction of the picking shoulder 28 of pick 25 to a sufficient degree to fully release reed 16 when the key is depressed. Here it will be appreciated that if a greater force is exerted by the player on the key, the reed 16 will experience a more sharply accelerated and quick release upon the retraction of pick 25 effected by the pick stop 29. Correspondingly when but a light touch is applied by the player, the pick 25 will not retract shoulder 28 from the reed 16 as rapidly, and the induced vibration in reed 16 will be correspondingly less. Variations in the "touch" may be further achieved by slightly rounding the shoulder 28 of the pick 25.

Tension spring 30 fixed to the upper housing 10 and the key 19 by means of any suitable fastening, provides the necessary force to return the key to its normal position. In the present instance, spring 30 has been attached to a curved hook 31 mounted adjacent the base of upper pick stop 29*a*, and a J-screw 32 mounted in the key 19 immediately back of the music rack base 15. Suitable equivalents are available for effecting the return of key 19. For example, a compression spring could be placed beneath the key with equivalent results.

In order to further duplicate the effect of a conventional piano, damping pad 34 has been affixed to the upper portion of key 19 beneath its vibrating reed 16. As the key is slowly released by the player, and it is returned to the normal position by the action of tension spring 30, the damping pad 34 engages the vibrating reed 16. The damping effect on the vibrating will, of course, vary in accordance with the extent to which it is pressed against the vibrating reed 16. Thus if the player wants to hold a long note, the key 19 is depressed for a longer period of time. If a series of short notes are contemplated, the key is released quickly, and the damper 34 throttles the vibration of reed 16 to produce a short note.

Felts are contemplated at several locations in order to further impart to the miniature piano the touch of a conventional piano. A continuous long felt 35 is provided at the base of the music rack trough 15. This prevents the action of spring 30 returning the key with a jolt to its rest position. Key stop felts 36 and 38 are provided for the white and black keys respectively along the base of the housing 10 and beneath the forward portions of the respective keys.

The black keys 39 are of little or no different construction than a typical white key 19 as described above. They must be, of course, shorter than the white keys, and the white keys must be provided with suitable recesses 40 to receive the black keys, but otherwise their general function and construction are closely comparable.

It is contemplated in manufacture that the reed tone board comprising the reeds and the tone beam 18 could be manufactured as a separate unit, the housing 10 as a separate unit, and the key movements as separate units. It will be readily apparent from the foregoing description that by merely inserting the key pivot pin 20 in place after the keys have been arranged in position and affixing the key return springs 30, the miniature piano can be readily and inexpensively assembly. All of its parts are proportioned to fit within a minimum of space, and yet it is conveniently designed to make the maximum use of the housing 10 as a sounding board, and as a music rack. The entire internal portion of the housing 10, which is slightly more than three times the thickness of a key, houses the entire movement as well as the tone unit.

I claim as my invention:

1. A piano movement for picking a vibrating reed comprising, in combination, a pivoted key, a pick pivotally mounted to said key at an intermediate portion thereof, said pick being characterized by rounded ends extending beyond the key and a shoulder adjacent the reed, yieldable means urging said key upwards, a pad stop leveling said key in its released up position, a pad stop engaging and limiting the downward travel of said key, offset stops alternatively engaging the ends of said pick and imparting a reciprocating movement thereto, and a tone damper affixed to the key behind the pick and selected to progressively dampen the vibrating reed when the key is released.

2. A piano movement for picking a vibrating reed comprising, in combination, a pivotally mounted key, a pick pivotally mounted to said key positioned for selective engagement with said vibrating reed, said pick being characterized by rounded ends and a shoulder adjacent said reed, and stops alternatively engaging the ends of said pick which impart a reciprocating movement thereto, thereby retracting the pick when the key is depressed and relocating its shoulder for subsequent engagement with the reed when the key is released.

3. In a piano having a plurality of keys pivotally mounted as a second-class lever, the combination comprising picks extending above and below said keys and pivotally mounted therein, a housing, opposed stops mounted on the top and bottom of said housing alternately engaging the ends of said picks, and vibrating reeds mounted paraxially with said keys, said reed being fixed to the housing at one end and responsively engaging a pick at its other end.

4. In a piano having a plurality of vibrating reeds picked responsively to the selective movement of its keys the keys being pivotally mounted at one end, a tone control comprising a soft pad located on the top of each of said keys and below each of said reeds intermediate the ends of the key proportioned for progressive engagement with its associated reed upon the release of each key.

5. In a piano deriving its tone from the picking of vibrating reeds responsive to the player's pressing of the keys, the combination comprising an elongated key pivotally mounted at one end, a pick pivotally mounted within said key with its ends extending above and below the key, a cantilever mounted reed positioned for picking by its associated pick, and offset opposed stops alternatively engaging the ends of said pick thereby imparting a relative reciprocating movement between the pick and its associated reed.

6. A piano deriving its tone from the picking of vibrating reeds, the keys comprising, in combination, a plurality of keys pivotally mounted at one end, a pick pivotally mounted within each of said keys each pick positioned to engage a vibrating reed, and offset opposed stops alternatively engaging the ends of said pick thereby imparting a relative reciprocating movement between the pick and its associated reed.

References Cited in the file of this patent

UNITED STATES PATENTS

605,764	Wascinski	June 14, 1898
699,840	Gilmore	May 13, 1902
1,745,265	Mecera	Jan. 28, 1930
1,995,316	Loar	Mar. 26, 1935

FOREIGN PATENTS

42,599	Germany	Mar. 1, 1888
176,424	Austria	Oct. 26, 1953