June 17, 1952 F. VAN DEN BERGH 2,601,185

ACTION FOR KEY-OPERATED MUSICAL INSTRUMENTS OF PERCUSSION TYPE

Filed Oct. 26, 1950 2 SHEETS--SHEET 1

Fig. 1

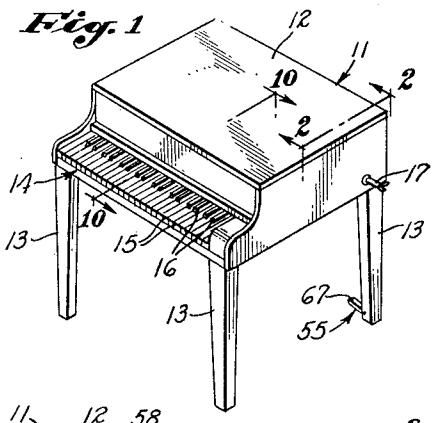


Fig. 4

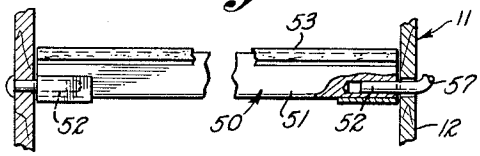


Fig. 2

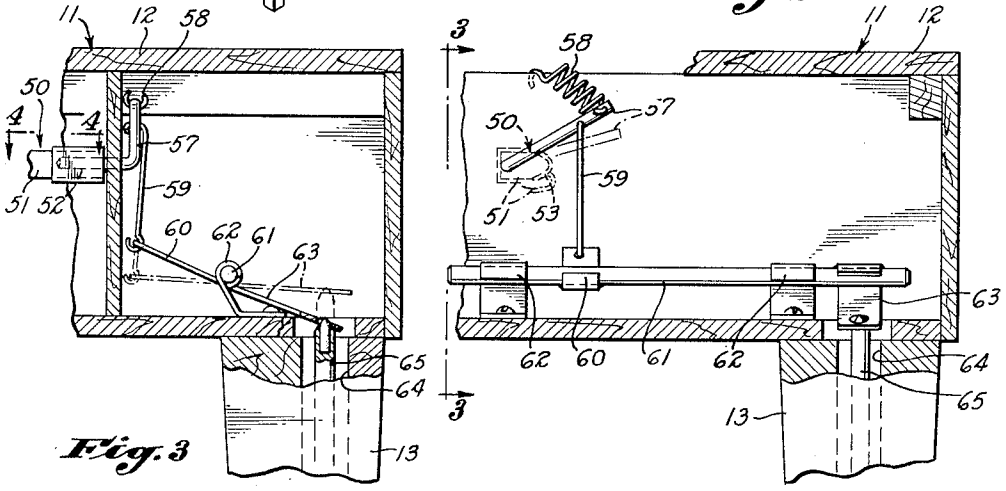


Fig. 3

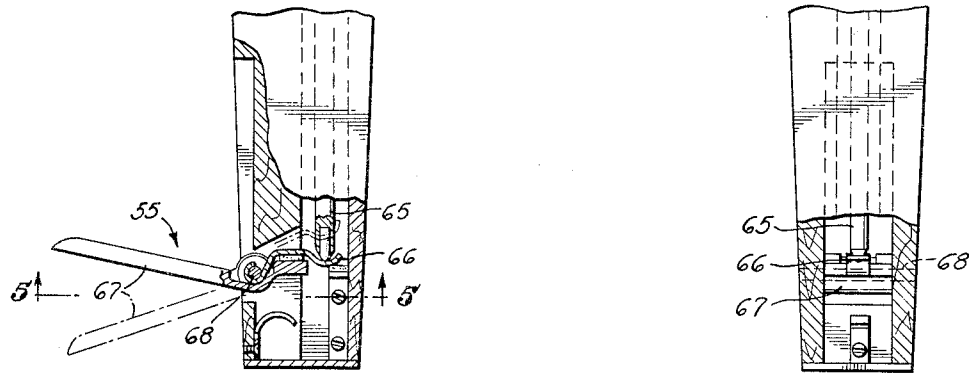
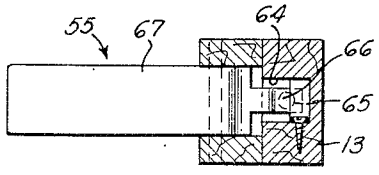


Fig. 5



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ACTION FOR KEY-OPERATED MUSICAL INSTRUMENTS OF PERCUSSION TYPE

Filed Oct. 26, 1950 2 SHEETS--SHEET 2

Fig. 6

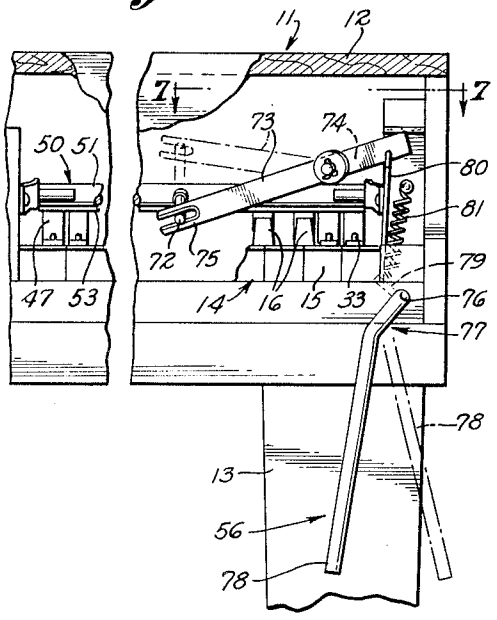


Fig. 7

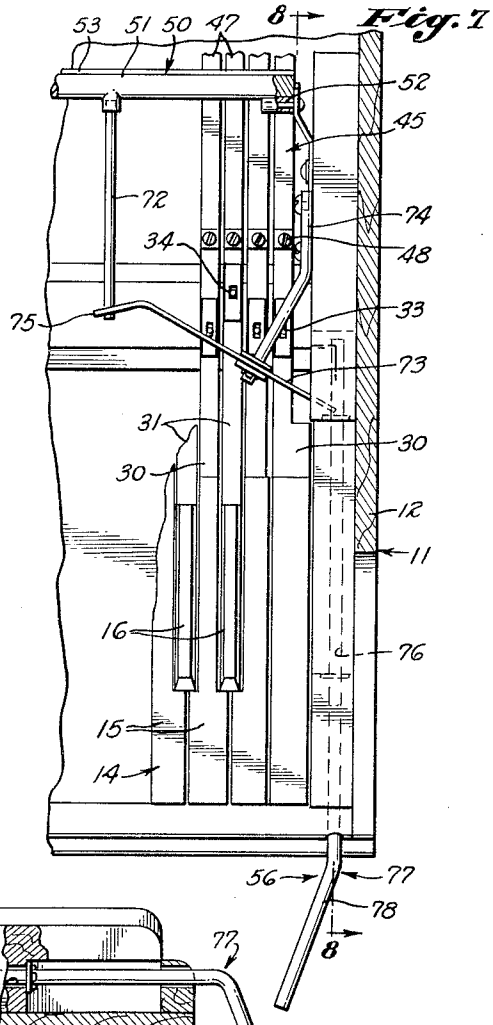


Fig. 8

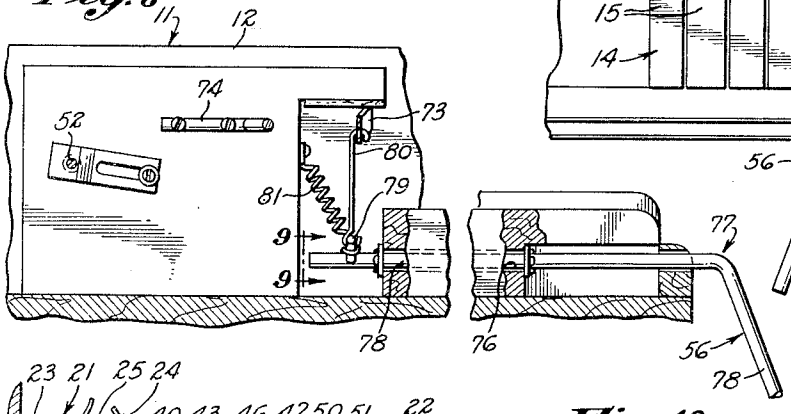
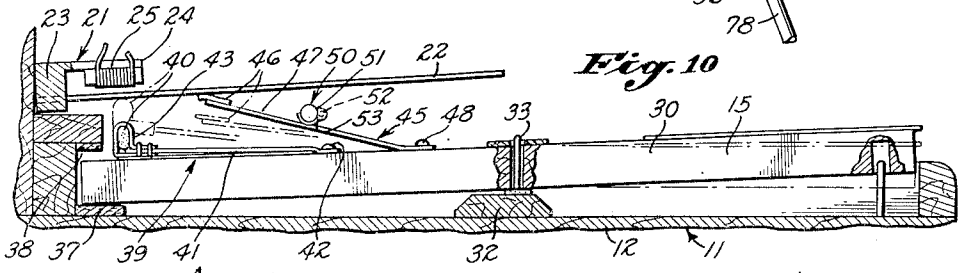


Fig. 10



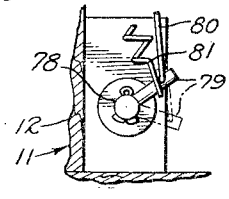


Fig. 9

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UNITED STATES PATENT OFFICE

2,601,185

ACTION FOR KEY-OPERATED MUSICAL INSTRUMENTS OF PERCUSSION TYPE

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Application October 26, 1950, Serial No. 192,283

14 Claims. (Cl. 84—1.04)

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The present invention relates in general to actions for key-operated musical instruments and, more particularly, to an action for a percussion instrument of the piano type having keys which are depressed by the player to operate striking or percussing mechanism for setting vibrators, such as reeds, strings, or the like, in motion to produce the desired tones, a primary object of the invention being to provide an improved and simplified action for such a musical instrument.

An important object of the invention is to provide for each vibrator a key, a percussing means, and a damping means all carried by a single pivoted lever or rocker, thereby avoiding any necessity for complex lever systems between the keys and the corresponding percussing mechanisms.

In general, the present invention contemplates a musical instrument which includes a frame carrying a supporting structure for a plurality of spaced vibrators and which includes a plurality of rockers pivotally mounted on said frame in alignment with the vibrators, respectively, and respectively rockable relative to the frame between operative and inoperative positions about transverse axes intermediate their respective ends.

One object of the invention is to provide an action for a musical instrument of the foregoing character in which a section of each rocker on one side of its pivot axis provides a key for rocking it from its inoperative position to its operative position.

Another object is to provide an action wherein each rocker carries a percussing means and a damping means on the side of its axis opposite the side carrying the corresponding key.

Another object is to provide stop means carried by the frame for limiting rocking movement of each rocker to movement between its inoperative and operative positions, and to provide a percussing means of the momentum type which includes a hammer pivotally mounted on the rocker and movable into striking engagements with the corresponding vibrator by its own momentum after movement of the corresponding rocker from its inoperative position to its operative position.

Another object is to provide an action wherein each damping means includes a damper which is pivotally mounted on the corresponding rocker

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and includes resilient means for biasing the damper toward the corresponding vibrator. A related object is to provide a damping means wherein a resilient cantilever element connected at one end to the corresponding rocker carries the damper and biases it toward the corresponding vibrator.

An important object is to provide means adapted to engage all of such cantilever elements for deflecting the cantilever elements away from the vibrator as the rockers are moved from their inoperative positions to their operative positions so as to prevent damping of the vibrators as they are struck by the hammers, whereby the dampers disengage the vibrators during the intervals that the hammers strike the vibrators.

Another object is to provide an action wherein the means defined in the preceding paragraph comprises an eccentric means which is rotatable to vary the damping effect of the dampers on the vibrators from zero damping to complete damping.

Another object is to provide both key and pedal controls for such eccentric means.

Another object is to provide a musical instrument of the foregoing character having pick-up coils respectively corresponding to the vibrators and adapted to be connected through an amplifier to a reproducer, whereby to provide an electrical musical instrument.

The foregoing objects and advantages of the present invention, together with various other objects and advantages thereof which will become apparent, may be attained with the exemplary embodiments of the inventions which are illustrated in the accompanying drawings and which are described in detail hereinafter. Referring to the drawings:

Fig. 1 is an isometric view of a musical instrument which embodies the invention;

Fig. 2 is an enlarged, fragmentary sectional view taken along the broken line 2—2 of Fig. 1 and illustrating one embodiment of a damper control of the invention;

Fig. 3 is a fragmentary sectional view taken along the broken line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional view taken along the broken line 4—4 of Fig. 3;

Fig. 5 is a fragmentary sectional view taken along the broken line 5—5 of Fig. 3;

Fig. 6 is a fragmentary sectional view illus-

trating another embodiment of a damper control of the invention;

Fig. 7 is a fragmentary sectional view taken along the broken line 7—7 of Fig. 6;

Fig. 8 is a fragmentary sectional view taken along the broken line 8—8 of Fig. 7;

Fig. 9 is a fragmentary sectional view taken along the broken line 9—9 of Fig. 8; and

Fig. 10 is an enlarged, fragmentary sectional view taken along the broken line 10—10 of Fig. 1 and illustrating the key action of the invention.

Referring first to Fig. 1 of the drawings, illustrated therein is a musical instrument of the piano type, exemplified as an electric organ. The instrument includes a frame 11 which is illustrated as and preferably takes the form of a case 12 having legs 13. The instrument also is provided with a keyboard 14 having white and black keys 15 and 16, as is conventional. Extending from the case 12 is an electrical cable 17 comprising a plurality of leads for connecting pick-up coils to be described hereinafter to an amplifier and reproducer, or to an amplifier and/or speaker in the case 12, as is conventional in electric organs.

Referring now to Fig. 10, the frame 11 carries a supporting structure 21 for a plurality of spaced, parallel vibrators 22 which are illustrated as reeds and only one of which is visible in Fig. 10. The vibrators 22 are of different lengths so that they vibrate at different frequencies to produce different tones, as is well known in the art. Although the vibrators 22 have been illustrated as reeds, it will be understood that other vibrators, such as strings, may be employed in connection with the present invention.

The supporting structure 21 may be divided into a plurality of supports 23 each of which carries one or more of the vibrators 22 and each of which is provided with one or more fingers 24 each carrying a pick-up coil 25, the leads of such pick-up coils being incorporated in the electric cable 17 discussed previously. While the supporting structure 21 may be divided into a plurality of supports 23 each carrying one or more of the vibrators 22 and coils 25, it will be understood that the supporting structure may comprise a single support carrying all of the vibrators, one or more pick-up coils being employed in this instance.

Referring to Figs. 6, 7 and 10, the action for the instrument comprises a plurality of rockers 30, 31 which are aligned with the respective vibrators 22 and which are disposed therebelow in the particular construction illustrated, it being understood that there is one of the rockers 30 or 31 for each of the vibrators 22. As best shown in Fig. 10, the frame 11 provides a rail 32 which is disposed below the rockers 30 and 31 and extends transversely thereof, the rockers 30 being pivotally mounted on the rail 32 for rocking movement thereon and being retained by pins 33. Thus, each rocker 30 is adapted to rock about a transverse axis intermediate its ends. The rockers 31 rock on the rail 32 in a similar manner and are similarly retained by pins 34, Fig. 7, the rockers 31 being rockable about transverse axes which are spaced slightly from the transverse pivot axes of the rockers 30.

The rockers 30 carry the white keys 15 and the rockers 31 carry the black or half-note keys 16. The keys are preferably formed by applying to the rockers 30 and 31 veneers of the usual key materials, although the keys may be formed separately and rigidly connected to the rockers if desired.

The rockers 31 are substantially identical to the rockers 30 and, as a matter of convenience, only one of the rockers 30 will be considered in detail.

Referring to Fig. 10 of the drawings, the rocker 30 illustrated therein is pivotable between an inoperative position, which is shown in solid lines, to an operative position, which is shown in broken lines, when the key 15 at one end thereof is depressed by the player. The rocking movement of the rocker 30 is limited to movement between its operative and inoperative positions by a stop means which comprises stops or pads 37 and 38 of felt, or other suitable material, carried by the frame 11. Carried by the rocker 30 on the opposite side of its pivot axis from the key 15 is a momentum percussing means 39 comprising a hammer 40 pivotally mounted on the rocker. In the particular construction illustrated, the pivotal mounting of the hammer 40 is achieved by attaching one end of a flexible element, such as a thin metal strip or wire, to the rocker at 42, the hammer 40 being secured to the other end of the flexible element. Thus, the effect of a pivotal connection for the hammer is attained. Preferably, the hammer 40 is covered by a strip 43 of felt, or other suitable material, suitably connected to the flexible element 41. As will be apparent, when the player strikes the key 15, the rocker 30 moves from its inoperative position to its operative position and strikes the stop 38. However, because of the pivotal connection of the hammer 40 to the rocker, the momentum of the hammer carries it into engagement with the corresponding vibrator 22, as illustrated in broken lines in Fig. 10 of the drawings. Consequently, the hammer actuates the vibrator to produce the desired tone. Subsequently, the hammer 40 returns to its inoperative position, wherein it rests on the rocker 30, by the action of gravity. If desired, a resilient material may be employed for the flexible element 41 to assist in returning the hammer. Preferably, the rocker 30 is so balanced that it returns to its inoperative position, wherein it engages the stop 37, under the influence of gravity also, although, as will be discussed hereinafter, a damping means 45 of the invention assists in restoring the rocker to its inoperative position.

Considering the damping means 45, it includes a damper 46, preferably a pad of felt, or other suitable material, which is adapted to engage the corresponding vibrator 22 and which is biased toward such vibrator by a resilient cantilever element 47, such as a strip of spring metal. The damper 46 is secured to the free end of the cantilever element 47 and the fixed end thereof is secured to the rocker 30 at 48 on the same side of the pivot axis of the rocker as the percussing means 39.

Associated with the respective damping means 45 on the rockers 30 and 31 and common thereto is an eccentric means 50 which extends transversely of and spans all of the rockers 30 and 31 and which is disposed between the vibrators 22 and the cantilever elements 47 of the damping means. Two embodiments of the eccentric means 50 are illustrated in Figs. 2 to 5 and Figs. 6 to 9, respectively, but since the differences therebetween are minor, identical reference nu-

merals will be employed for corresponding parts.

The eccentric means 50 includes an eccentric 51 which spans all of the rockers 30 and 31 and which is disposed between the cantilever elements 47 and the vibrators 22, the eccentric being provided at its ends with pins 52 which are suitably mounted for rotation on the frame 11. As best shown in Fig. 10, the eccentric 51 is adapted to engage the cantilever elements 47 intermediate their respective ends, a strip 53 of felt, or other suitable material preferably being provided on the eccentric for engagement with the cantilever elements. As will be apparent, rotation of the eccentric 51 about the axis of the pins 52 which carry it results in varying the positions of the dampers 46 relative to the corresponding vibrators 22. For example, referring to Fig. 10, if the eccentric is rotated in the counterclockwise direction from the position indicated in solid lines to that indicated in broken lines, the cantilever elements 47 are flexed in a direction away from the vibrators 22 to move the dampers 46 in a direction away from the vibrators in opposition to the biasing actions of the cantilever elements. Thus, by varying the position of the eccentric 51, the damping action of the dampers 46 may be varied. Preferably, the eccentric 51 is so positioned and its dimensions are such that it may be rotated to vary the damping action from zero to complete damping. In other words, the eccentric 51 may be rotated from a position wherein it permits continuous contact of the dampers 46 with the vibrators 22 to provide complete damping to a position wherein it prevents any contact between the dampers 46 and the vibrators to provide zero damping.

It should be noted that the eccentric 51 performs another important function in that, when the keys 15 and 16 are struck to cause the corresponding hammers 40 to strike the corresponding vibrators 22, the eccentric acts as a stop for preventing upward movement of the intermediate sections of the cantilever elements 47 so that the cantilever elements are flexed away from the vibrators 22 to move the dampers 46 away from the vibrators. Thus, if the eccentric 51 is positioned so that the dampers 46 engage the vibrators 22 when the rockers 30 and 31 are in their inoperative positions, the eccentric acts on the cantilever elements 47 as the rockers 30 and 31 are rocked into their operative positions to disengage the dampers 46 from the vibrators 22. Consequently, the vibrators are undamped when struck by the hammers, the dampers 46 subsequently re-engaging the vibrators, as the rockers 30 and 31 return to their inoperative positions, to provide the desired damping action. Also, when the eccentric 51 is so positioned, the flexing of the cantilever elements 47 produced assists in restoring the rockers 30 and 31 to their inoperative positions, which is another feature. It will be understood that if the eccentric 51 is positioned for complete damping, it is rotated into a position such that it is not engaged by the cantilever elements 47 during rocking movement of the rockers 30 and 31 into their operative positions. However, it is rarely necessary to utilize complete damping so that normally the action is as described above.

Considering briefly the over-all operation of the key action of the invention, it will be apparent that, as the player strikes selected ones of the white and black keys 15 and 16, the corresponding rockers 30 and 31 are rotated from their inoperative positions to their operative positions to actuate the corresponding percussing means 39, the corresponding hammers 40 being carried by their own momentum into striking engagement with the corresponding vibrators 22 after the rockers attain their operative positions and strike the stops 38. Assuming that the eccentric 51 is adjusted for partial damping, the eccentric acts as a stop for the intermediate sections of the cantilever elements 47 on the struck keys 15 and 16 and causes the cantilever elements to flex toward the corresponding rockers, whereby the dampers 46 carried by such cantilever elements disengage the matching vibrators as the latter are struck by the corresponding hammers. Subsequently, the dampers re-engage the vibrators as the rockers return to their inoperative positions to provide the desired damping effect. As hereinbefore indicated, the position of the eccentric 51 may be varied to provide any degree of damping between continuous or complete damping and zero damping.

In order to permit the player to adjust the position of the eccentric 51 as required to provide the desired damping action, an actuating means for the eccentric is provided, such actuating means taking the form of a foot-operated actuator 55 in Figs. 2 to 5 of the drawings, and taking the form of a knee-operated actuator 56 in Figs. 6 to 9 of the drawings.

Considering first the foot-operated actuator 55 illustrated in Figs. 2 to 5 of the drawings, the eccentric 51 is provided at one end with a crank arm 57 which may be formed integrally with one of the pins 52 carrying the eccentric, as illustrated. As viewed in Fig. 2, the eccentric is normally biased in the counterclockwise direction by a tension spring 58 connected at one end to the crank arm 57 and at its other end to the frame 11, the spring 58 biasing the eccentric toward a position wherein it disengages the cantilever elements 47 so as to provide zero damping. Also connected to the crank arm 57 is a link 59, the latter being pivotally connected at one end to the crank arm and at its other end to an arm 60 on a shaft 61 supported in suitable bearings 62 carried by the frame 11.

The shaft 61 is provided with another arm 63 which registers with an axial bore 64 through one of the legs 13. Disposed in the bore 64 is a rod 65 having a conical upper end disposed in a hole in the arm 63 and having a conical lower end disposed in a socket 66 in a pedal 67 pivotally mounted on the leg by a pin 68. As will be apparent, as the player depresses the pedal 67 with his foot, the intervening linkage results in rotation of the eccentric 51 in the clockwise direction, as viewed in Fig. 2, in opposition to the action of the spring 58 so as to move the eccentric into engagement with the cantilever elements 47 to increase the damping effect. As will be apparent, the greater the depression of the pedal 67 by the foot of the player, the lesser the damping action, the damping action being complete when the pedal is at the upper limit of its travel and being zero when the pedal is at the lower limit of its travel.

Considering now the knee-operated actuator 56 illustrated in Figs. 6 to 9 of the drawings, it also includes a crank arm, 72, rigidly connected to and extending transversely from the eccentric 51. As best shown in Figs. 6 and 7, a lever 73 is pivotally mounted on a bracket 74 connected to the frame 11, and is bifurcated at one end 75 to receive the crank arm 72. Rotatably mounted on the frame 11, as by being disposed in a bore

76 therein, Fig. 8, is a knee crank 77 having a depending crank arm 78 engageable by the knee of the player. The knee crank 77 is also provided with a crank arm 79 which is connected to the other end of the lever 73 by a link 80, pivotal connections being provided between the link and the lever and between the link and the crank arm 79. A tension spring 81 is connected at one end to the crank arm 79 and at its other end to the frame 11 in a manner to bias the elements of the actuator 56 into the positions shown in solid lines in Fig. 6. As will be apparent, when the operator engages the depending crank arm 78 and rotates the knee crank 77 into the position shown in broken lines in Fig. 6, rotation of the lever 73 into the position shown in broken lines in Fig. 6 results. Such rotation of the lever rotates the eccentric 51 into engagement with the cantilever elements 47 to decrease the damping action, the damping action being complete when the knee crank 77 is in the position shown in solid lines and being zero in the position shown in broken lines.

While I have disclosed exemplary embodiments of my invention for purposes of illustration, it will be understood that various changes, modifications and substitutions may be incorporated in the embodiments disclosed without departing from the spirit of the invention.

I claim as my invention:

1. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame and having a key; a hammer aligned with said vibrator and actuable by said rocker to strike said vibrator upon rocking movement of said rocker by said key; adjustable damping means carried by said rocker, said damping means including a damper which is aligned with and engageable with said vibrator and which is pivotally mounted on said rocker, and including resilient means for biasing said damper toward said vibrator; and means carried by said frame and engageable with said damping means for adjusting said damping means to vary the damping effect thereof on said vibrator.

2. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame in alignment with said vibrator for rocking movement between operative and inoperative positions about an axis intermediate the ends of said rocker, a section of said rocker on one side of said axis providing a key for rocking said rocker from said inoperative position to said operative position; momentum percussing means pivotally mounted on said rocker on the other side of said axis and adapted to strike said vibrator upon rocking movement of said rocker from said inoperative position to said operative position by said key; and damping means pivotally mounted on said rocker on said other side of said axis and engageable with said vibrator to damp vibrations of said vibrator produced by said percussing means, said damping means being biased toward said vibrator.

3. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame in alignment with said vibrator for rocking movement between operative and inoperative positions about an axis intermediate the ends of said rocker, a section of said rocker on one side of said axis providing a key for rocking said rocker from said inoperative position to said operative position; momentum percussing means pivotally mounted on said rocker on the other side of said axis and adapted to strike said vibrator upon rocking movement of said rocker from said inoperative position to said operative position by said key; damping means pivotally mounted on said rocker on said other side of said axis and engageable with said vibrator to damp vibrations of said vibrator produced by said percussing means, said damping means being biased toward said vibrator; and means carried by said frame and engageable with said damping means for disengaging said damping means from said vibrator in response to rocking movement of said rocker from said inoperative position to said operative position.

4. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame in alignment with said vibrator for rocking movement between operative and inoperative positions about an axis intermediate the ends of said rocker, a section of said rocker on one side of said axis providing a key for rocking said rocker from said inoperative position to said operative position; momentum percussing means pivotally mounted on said rocker on the other side of said axis and adapted to strike said vibrator upon rocking movement of said rocker from said inoperative position to said operative position by said key; damping means pivotally mounted on said rocker on said other side of said axis and engageable with said vibrator to damp vibrations of said vibrator produced by said percussing means, said damping means being biased toward said vibrator; means carried by said frame and engageable with said damping means for disengaging said damping means from said vibrator in response to rocking movement of said rocker from said inoperative position to said operative position; and means connected to the means last defined for varying the position of said last-defined means relative to said frame.

5. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame in alignment with said vibrator for rocking movement between operative and inoperative positions about a transverse axis intermediate the ends of said rocker, a section of said rocker on one side of said axis providing a key for rocking said rocker from said inoperative position to said operative position; stop means carried by said frame and engageable with said rocker for limiting rocking movement of said rocker to movement between said operative and inoperative positions; momentum percussing means carried by said rocker on the other side of said axis, said percussing means including a hammer pivotally mounted on said rocker and movable into striking engagement with said vibrator by its own momentum upon rocking movement of said rocker from said inoperative position to said operative position; adjustable damping

means carried by said rocker on said other side of said axis, said damping means including a resilient cantilever element which is connected at one end to said rocker and which is provided at its other end with a damper adapted to engage said vibrator, said cantilever element biasing said damper toward said vibrator; and means carried by said frame for adjusting said damping means.

6. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame in alignment with said vibrator for rocking movement between operative and inoperative positions about a transverse axis intermediate the ends of said rocker, a section of said rocker on one side of said axis providing a key for rocking said rocker from said inoperative position to said operative position; stop means carried by said frame and engageable with said rocker for limiting rocking movement of said rocker to movement between said operative and inoperative positions; momentum percussing means carried by said rocker on the other side of said axis, said percussing means including a hammer pivotally mounted on said rocker and movable into striking engagement with said vibrator by its own momentum upon rocking movement of said rocker from said inoperative position to said operative position; adjustable damping means carried by said rocker on said other side of said axis, said damping means including a resilient cantilever element which is connected at one end to said rocker and which is provided at its other end with a damper adapted to engage said vibrator, said cantilever element biasing said damper toward said vibrator; and rotatable eccentric means carried by said frame and adapted to engage said cantilever element intermediate its ends for adjusting said damping means, said eccentric means being disposed between said cantilever element and said vibrator.

7. In an action for a key-operated musical instrument of the percussion type which includes a vibrator and a support therefor, the combination of: a frame carrying said support with said vibrator thereon; a rocker pivotally mounted on said frame in alignment with said vibrator for rocking movement between operative and inoperative positions about a transverse axis intermediate the ends of said rocker, a section of said rocker on one side of said axis providing a key for rocking said rocker from said inoperative position to said operative position; stop means carried by said frame and engageable with said rocker for limiting rocking movement of said rocker to movement between said operative and inoperative positions; momentum percussing means carried by said rocker on the other side of said axis, said percussing means including a hammer pivotally mounted on said rocker and movable into striking engagement with said vibrator by its own momentum upon rocking movement of said rocker from said inoperative position to said operative position; adjustable damping means carried by said rocker on said other side of said axis, said damping means including a resilient cantilever element which is connected at one end to said rocker and which is provided at its other end with a damper adapted to engage said vibrator, said cantilever element biasing said damper toward said vibrator; an eccentric extending transversely of said rocker and rotatably mounted on said frame for rotation about an axis extending transversely of said rocker, said eccentric being disposed between said cantilever element and said vibrator and being engageable with said cantilever element intermediate its ends, and said eccentric being rotatable to vary the position of said damper relative to said vibrator when said rocker is in said inoperative position; and means for rotating said eccentric.

8. An action as defined in claim 7 wherein said means for rotating said eccentric includes a crank arm connected to said eccentric and includes a manually operable actuator connected to said crank arm.

9. An action as defined in claim 7 wherein said means for rotating said eccentric includes a crank arm connected to said eccentric and includes a manually operable actuator connected to said crank arm, said actuator including a knee-operable element pivotally mounted on said frame and operatively connected to said crank arm.

10. An action as defined in claim 7 wherein said means for rotating said eccentric includes a crank arm connected to said eccentric and includes a manually operable actuator connected to said crank arm, said actuator comprising a foot-operable element pivotally connected to said frame and operatively connected to said crank arm.

11. In a key-operated musical instrument of the percussion type, the combination of: a frame; a supporting structure carried by said frame; a plurality of vibrators carried by said supporting structure in spaced relation; a plurality of rockers pivotally mounted on said frame in spaced relation and in alignment with said vibrators, respectively, for rocking movement between operative and inoperative positions about transverse axes intermediate the ends of said rockers, respectively, a section of each of said rockers on one side of its said axis providing a key for rocking such rocker from its said inoperative position to its said operative position; momentum percussing means carried by each of said rockers on the other side of its said axis, each of said percussing means including a hammer pivotally mounted on its said rocker and movable into striking engagement with the vibrator in alignment with such rocker by its own momentum upon rocking movement of such rocker from its said inoperative position to its said operative position; adjustable damping means carried by each of said rockers on said other side of its said axis, each of said damping means including a resilient cantilever element which is connected at one end to its said rocker and which is provided at its other end with a damper adapted to engage the vibrator in alignment with such rocker, said contilever elements biasing said dampers towards said vibrators; and rotatable eccentric means carried by said frame and extending transversely of said rockers and adapted to engage said cantilever elements intermediate their respective ends for adjusting said damping means, said eccentric means being disposed between said vibrators and said cantilever elements.

12. A musical instrument as defined in claim 11 wherein said supporting structure for said vibrators carries at least one pick-up coil.

13. In an action for a key-operated musical instrument of the percussion type, the combination of: a frame; a rocker pivotally mounted on

said frame for pivotal movement about a horizontal axis and having a key on one side of said axis; momentum percussing means carried by said rocker on the upper side thereof and on the other side of said axis, said momentum percussing means being pivotally connected to said rockers; damping means carried by and disposed above said rocker, said damping means including a damper which is located on said other side of said axis and which is pivotally connected to said rocker, said damping means including resilient means for biasing said damper upwardly;

and stop means carried by said frame and engageable by said damping means upon upward movement of said damping means.

14. An action as defined in claim 13 wherein said stop means is movable relative to said frame to vary the extent to which said damping means must move upwardly before engaging said stop means, whereby to vary the damping effect of said damping means.

FRANS VAN DEN BERGH.

No references cited.