Feb. 18, 1969 C. L. FENDER 3,427,916

GUITAR AND ADJUSTABLE MUTE THEREFOR

Filed June 2. 1966

Sheet 1 of 2

FIG. 1

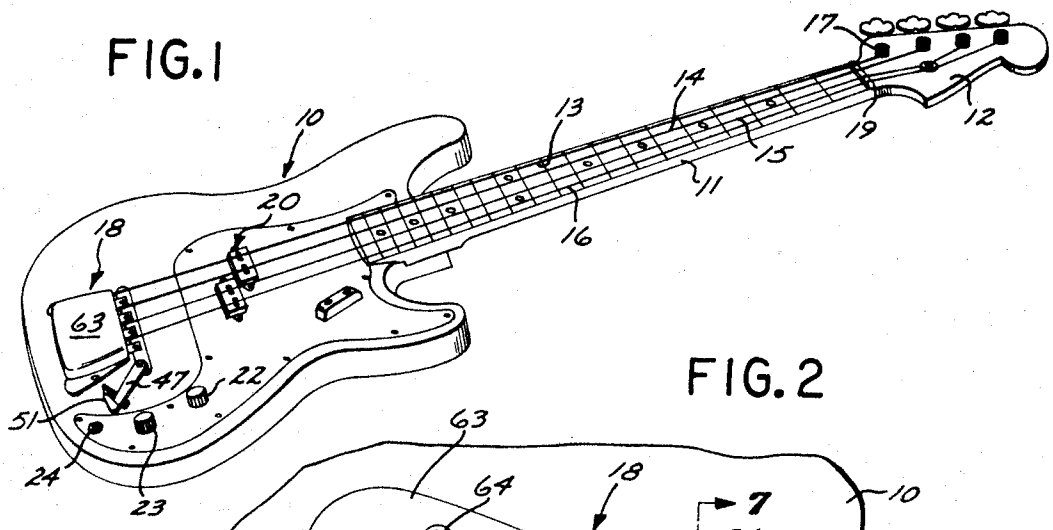


FIG. 2

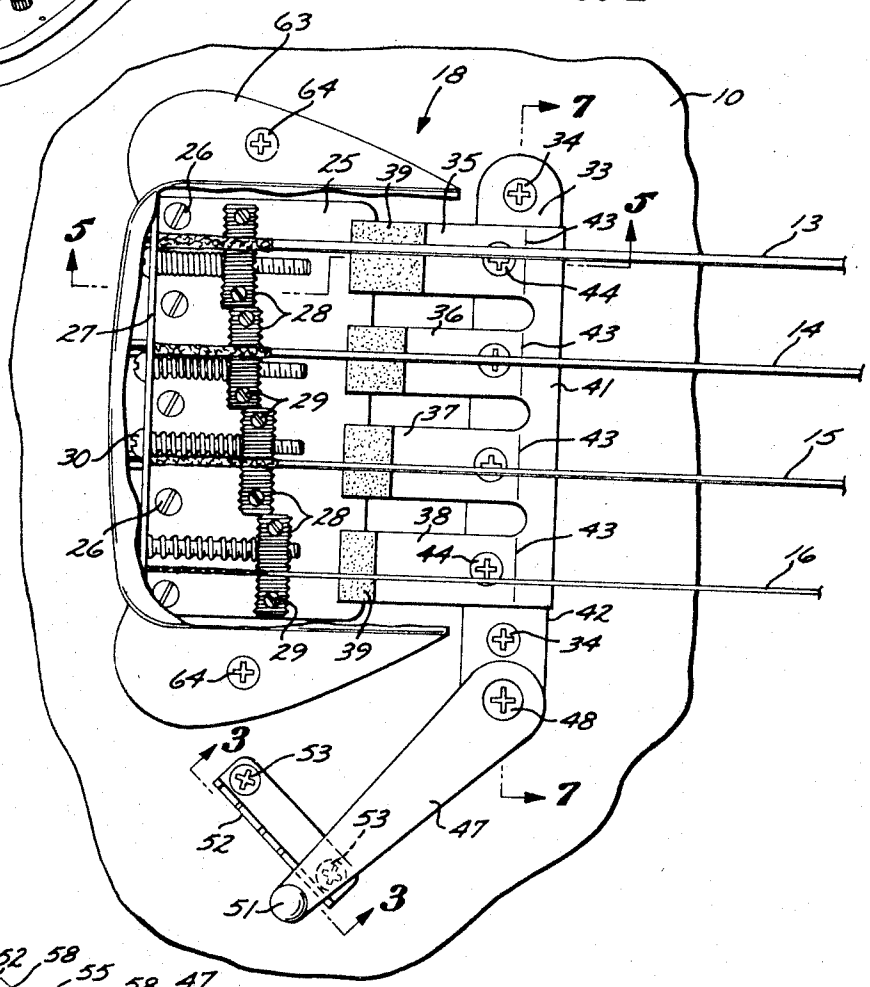
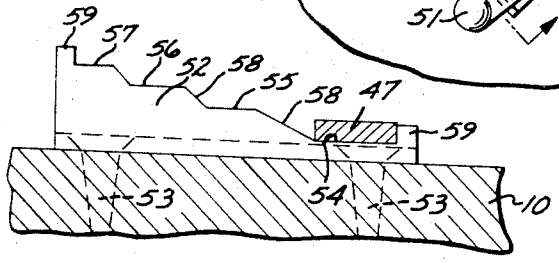


FIG. 3



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FIG. 5

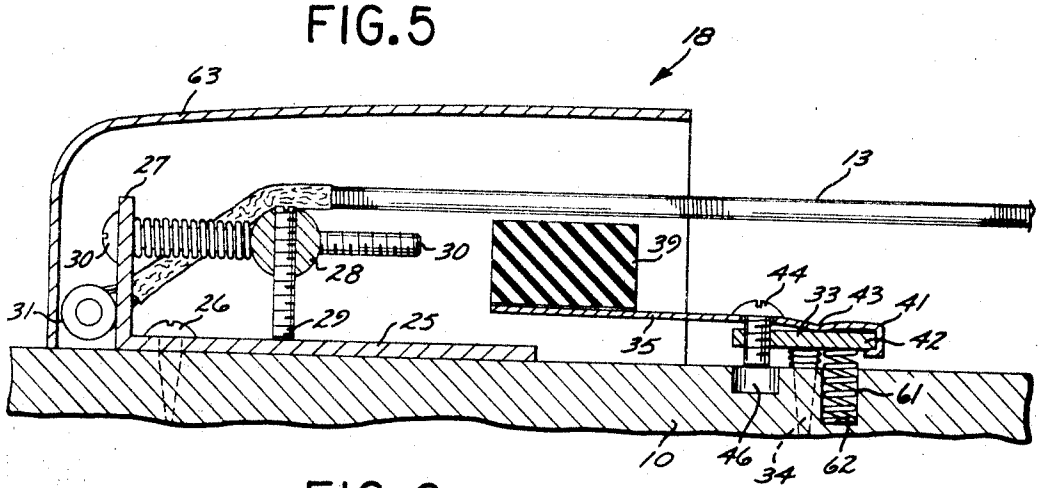


FIG. 6

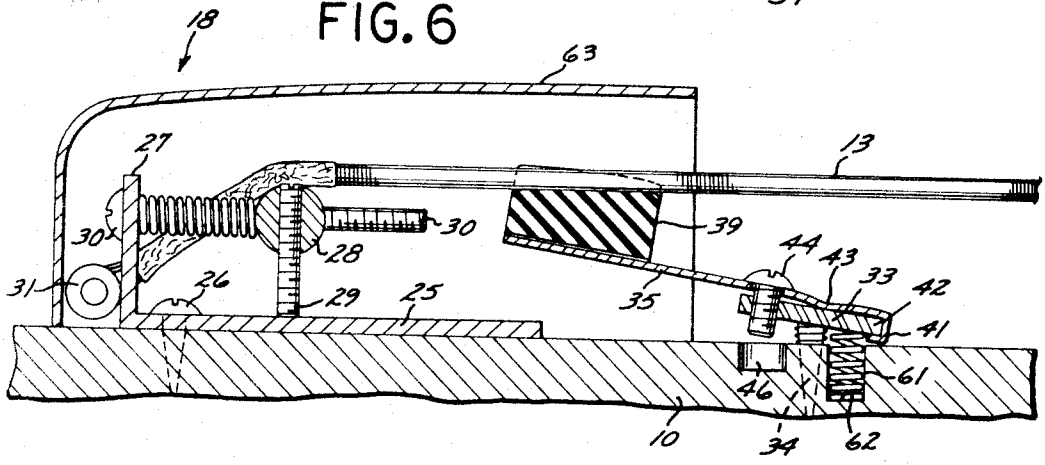


FIG. 7

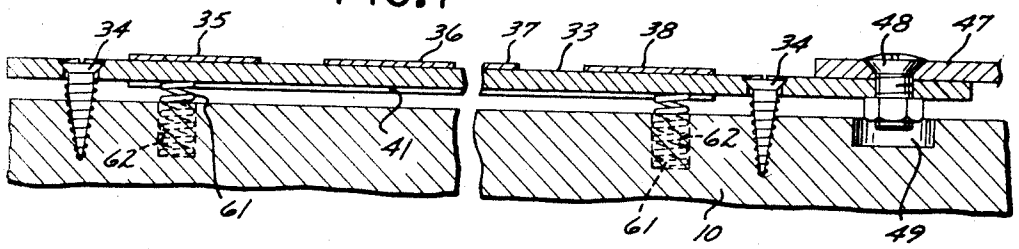
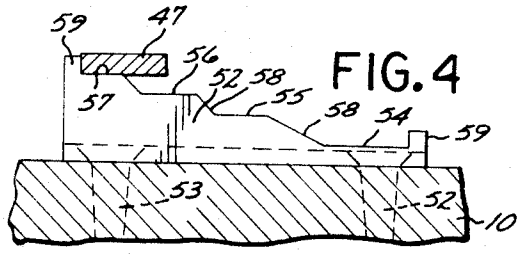


FIG. 4



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United States Patent Office 3,427,916
Patented Feb. 18, 1969

3,427,916

GUITAR AND ADJUSTABLE MUTE THEREFOR

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Filed June 2, 1966, Ser. No. 554,828
U.S. Cl. 84—267 13 Claims
Int. Cl. G10d 3/04; G10c 3/26

ABSTRACT OF THE DISCLOSURE

A bass guitar incorporating a spring-finger mute, there being one spring finger for each guitar string, such spring finger having a resilient damper means on the string-engaging end thereof. Screws are provided to individually adjust each spring to thereby regulate the muting pressures. Pivot and actuating means are provided to simultaneously release or engage all of the damper elements.

This invention relates to a guitar and to an adjustable mute for damping vibrations of the guitar strings. The invention is particularly adapted to be employed in conjunction with a bass guitar, although it may also be employed in conjunction with a conventional Spanish guitar, steel guitar, etc.

It is known in the art to provide spring-finger mutes for the individual strings of a bass guitar. Heretofore, however, no practical, economical and effective way has been devised for effecting individual adjustment of the spring pressure applied by each individual mute portion. Thus, musicians employing bass guitars have been forced to resort to such expedients as manual bending of the individual spring fingers in an attempt to regulate spring pressure. This, however, was totally unsatisfactory in that the degree of spring pressure could not be accurately controlled, and because repeated manual bending of the individual springs resulted in damage thereto.

In addition to the above, and insofar as is known to applicant, no practical method has as yet been devised for effecting conjoint adjustment of the various fingers of a bass mute in order to regulate the degree of muting. Thus, for example, it will be understood that there are times during a performance when no muting is desired, other times when full muting is desired, and other times when an intermediate degree of muting is wanted. It is therefore desirable to provide a practical, effective, and simple means whereby the guitarist may rapidly adjust the degree of muting, at any time during a performance, in a predetermined manner.

In view of the above and other factors characteristic of the field of mutes for guitars and the like, it is a primary object of the invention to provide a mute comprising a plurality of spring fingers having muting portions adapted to resiliently engage the individual strings of a guitar, in combination with means for effecting accurate adjustment of each individual spring finger in order to regulate the degree of spring pressure.

Another object is to provide a guitar mute incorporating a plurality of spring fingers, in combination with means to effect conjoint adjustment of all of the spring fingers between a position at which there is no muting, a position at which there is full muting, and intermediate positions at which there are different desired degrees of muting.

These and other objects will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIGURE 1 is a perspective view of a bass guitar incorporating the muting means of the present invention;

FIGURE 2 is an enlarged plan view of the bridge and mute regions of the guitar of FIGURE 1, a portion of the bridge cover being broken away;

FIGURE 3 is a fragmentary vertical sectional view taken on line 3—3 of FIGURE 2, and showing a portion of the means for effecting conjoint adjustment of all of the spring fingers;

FIGURE 4 is a view corresponding to FIGURE 3 but illustrating a different adjusted position of the mute-operating means;

FIGURE 5 is a fragmentary longitudinal section taken on line 5—5 of FIGURE 2, illustrating one of the muting fingers in a retracted position at which no muting is effected;

FIGURE 6 is a view corresponding generally to FIGURE 5 but illustrating the finger in a position at which a substantial degree of muting is effected; and

FIGURE 7 is a sectional view taken on line 7—7 of FIGURE 2, but omitting the strings.

Referring first to FIGURE 1, a bass guitar is illustrated to comprise a body **10**, neck **11**, head **12**, and strings **13–16** inclusive. The strings lie generally in a single plane which is spaced above and generally parallel to the plane of the face of body **10**. Not only are the strings spaced above the body, but they are spaced from each other, extending in tensioned relationship from tuning screws **17** to a bridge and mute structure **18** to be described hereinafter. The strings extend over a nut (bridge) **19** adjacent head **12**, and also over a suitable pickup (transducer means) **20**.

Pickup **20** is electrically connected to control means **22** and **23** adapted to control the volume and tone of the electrical signal generated in response to vibration of one or more of the strings. A jack indicated at **24**, is adapted to receive a plug end of a cord which leads to a suitable amplifier and loudspeaker combination, not shown.

Proceeding next to a detailed description of the bridge and mute structure **18**, this is illustrated to comprise an angle plate **25** which is secured by screws **26** to the face of guitar body **10**. Mounted on such plate **25**, and adjustably connected to the flange portion **27** thereof, are a plurality of bridge barrels **28** each adapated to support one of the guitar strings **13–16**. Such bridge barrels, including the associated height-adjustment screws **29** and the longitudinal adjustment screws **30**, are described in detail in my previous Patent No. 2,573,254, issued Oct. 30, 1951, for Combination Bridge and Pickup Assembly for String Instruments. The strings **13–16**, after extending over the bridge barrels **28**, pass through small openings in the flange portion **27** and are anchored by means of eyelets indicated at **31** (FIGURES 5 and 6).

The mute portion of the bridge and mute structure **18** comprises an elongated mounting element **33** which, in the illustrated embodiment, is pivotally or rockably mounted for pivotal movement about an axis extending transverse to the strings **13–16**. Stated more definitely, the mounting element **33** is pivotally or rockably mounted for pivotal movement about an axis which is parallel to the plane of the strings, spaced a substantial distance beneath the strings, and perpendicular to individual ones of the strings. In the illustrated embodiment, such axis of pivotal movement is also the axis of the element **33** itself.

Referring to FIGURE 7, pivotal mounting of element **33** is illustrated as being effected by inserting mounting screws **34** through openings in element **33** and downwardly into body **10**. The holes through which screws **34** project are oversize, and the mounting element is maintained spaced above the face of body **10**, so that pivotal movement may be effected. Preferably, the mounting screws **34** have generally conical or rounded heads, and the holes through which they project are correspondingly counterbored.

A plurality of spring fingers **35–38** are connected to mounting element **33** and extend, respectively, generally parallel to and beneath the respective strings **13–16**. Each spring finger **35–38** is illustrated as being generally rectangular in shape, and is formed of a suitable spring metal such as a relatively light-gauge spring steel. At the ends of the spring fingers **35–38** which are remote from mounting element **33**, and relatively adjacent the bridge barrels **28**, are provided string-engaging pad or damping elements **39** adapted to resiliently engage the undersides of the respective strings as shown in FIGURE 6. Elements **39** may have progressively different sizes, as illustrated in FIGURE 2, being relatively large under the lower-pitched strings **13** and **14** and relatively small under the higher-pitched strings **15** and **16**.

The ends of the springs adjacent mounting element **33** are illustrated as being integral with a channel or hook portion **41** which corresponds generally to, and fits closely around, an edge **42** of mounting element **33**. Thus, and as shown in the drawing, the fingers and the channel portion may be stamped from a single sheet of spring steel. Edge **42** is preferably parallel to the described axis of pivotal movement of element **33**, being the edge of element **33** which is remote from bridge barrels **28**. It is pointed out, however, that the entire element **33** is mounted sufficiently close to the bridge barrels that the pad or damping elements **39** are relatively adjacent thereto.

Referring particularly to FIGURES 5 and 6, it is emphasized that each spring finger **35–38** is connected to the hook or channel portion **41** at an indented or fulcrum portion **43** which is generally parallel to the axis of pivotal movement. Such fulcrum portion **43** rests upon the upper surface of mounting element **33**, for a purpose to be described hereinafter.

In accordance with a very important feature of the present invention, an adjustment and mounting screw **44** is inserted downwardly through an oversize opening in each of the spring fingers **35–38**, being threaded through an internally-threaded opening in mounting element **33**. Such screws are spaced substantial distances from the above-indicated fulcrum portions **43**, having lower ends which may be inserted into corresponding recesses **46** in body **10** in order to prevent any interference between the body and the screws.

Each spring finger **35–38**, when in its natural or undeformed (free) condition, is bent upwardly relative to hook or channel portion **41** at an angle much greater than that illustrated in FIGURE 5 or FIGURE 6. Accordingly, the heads of adjustment screws **44** exert substantial downward forces upon the spring fingers, bending the same downwardly against the inherent spring bias therein. Despite the described bending, there is no upward pivoting of the channel or hook portion **41** about the fulcrum portion. Such upward pivoting is, instead, prevented by the lowermost region of the hook portion, which extends horizontally beneath edge **42**.

The described relationship provides an extremely simple, economical, attractive and effective means for causing the spring fingers **35–38** to move both upwardly and downwardly in accordance with the degree of threading of each screw **44** into the mounting element **33**. Only one adjustment and mounting screw is necessary for each finger, and no separate biasing springs are required, yet the musician can readily, by merely employing a screw driver, determine the exact degree of muting pressure which is exerted against an associated string **13–16**.

There will next be described the means for effecting pivotal or rocking movement of element **33** about the above-specified axis, in order to effect conjoint shifting of the pre-adjusted spring fingers **35–38** and damping elements **39** relative to strings **13–16**. Such means is illustrated to comprise a crank arm **47** which is pivotally connected to one end of mounting element **33**. As best shown in FIGURE 7, the pivotal connection may comprise a bolt or rivet **48** which projects through registered

openings in the elements **33** and **47**, above a clearance recess **49** in guitar body **10**. The end of crank arm **47** remote from mounting element **33** has provided thereon a knob or handle **51** adapted to facilitate pivoting of the arm **47** about a generally vertical axis (generally perpendicular to the face of the guitar body) through element **48**. The crank arm should not be able to pivot, relative to mounting element **33**, about any axis other than the indicated vertical one.

A cam-like step plate **52** is fixedly mounted on guitar body **10**, for example by means of screws **53** projecting through a base portion of the step plate. As best shown in FIGURES 3 and 4, the upper edge of the step plate **52** has a plurality (illustrated as four) of generally horizontal portions **54–57** each adapted to support the underside of crank arm **47**. Portions **54** are disposed at progressively different elevations, being connected by inclined cam surfaces **58** to facilitate shifting of the crank arm **47** between the various step positions. Stop ears **59** are provided at each end of the upper edge of the step plate in order to prevent pivotal shifting of the crank **47** to an undesired position.

Referring particularly to FIGURES 5 and 6, means are provided to bias the mounting element **33** in such direction that the lower surface of crank arm **47** always remains in resilient engagement with one of the horizontal portions **54–57**. Such bias means are illustrated to comprise helical compression springs **61** which are seated in recesses **62** in body **10**, bearing against the underside of the edge portion **42** of mounting element **33** (such edge being remote from the step plate). The bias means not only prevents undesired pivoting of element **33**, but also prevents undesired pivoting of crank arm **47** about the vertical axis through bolt **48**.

Substantially all, or all, of the assembly **18** may be covered by a housing means indicated at **63**, the illustrated housing being secured to the guitar body as by the screws shown at **64** in FIGURE 2. It is emphasized that the housing may also cover the mounting element **33** and much or all of the crank arm **47**.

Brief summary of operation

In setting the present adjustable mute prior to use during a musical performance, the operator merely pivots the crank arm **47** to the position shown in FIGURE 4, so that it rests on the uppermost horizontal portion **57** of the step plate **52**. Such pivotal movement is readily effected (for example from the position shown in FIGURES 2 and 3) because the edge of crank arm **47** rides up the various inclined cam portions **58**. The indicated elevating of the distal end of crank **47** effects pivoting of mounting element **33** from the position shown in FIGURE 5 to that shown in FIGURE 6, against the bias of the helical springs **61**.

Because the mute element is then in its maximum-muting position, the musician can readily adjust the degree of maximum muting by merely turning individual ones of the adjustment screws **44**. The turning of such screws causes individual pivotal movement of each of the mute fingers **35–38** about the associated fulcrum portion **43**. Thus, the guitarist may readily adjust the maximum degree of muting of each individual string of the guitar, independently of each and all other strings.

Once the degree of maximum muting has been adjusted in accordance with the desires of the musician, shifting of crank arm **47** to other positions will then achieve predetermined degrees or percentages of such maximum muting. When the crank **47** is on the lowermost horizontal portion **54** (FIGURES 2 and 3), the degree of muting is minimum. Frequently, but not necessarily (in accordance with the desires of the musician), when the crank arm **47** is on portion **54**, each damping element **39** is out of engagement with the associated string as shown in FIGURE 5.

With the described construction, and by a very simple movement which may be made at any time during a per-

formance, without even looking at the mute, the guitarist may shift the crank **47** to any one of four or more desired muting positions, thus achieving predetermined degrees of muting of the guitar strings. Because of the individual adjustment of the spring pressure for each individual string, the degree of muting is always precisely that which is desired by the guitarist.

It is emphasized that the vertical adjustability of the bridge barrels **28** makes the adjustability of the mute spring fingers **35–38** even more desirable than on guitars having bridges which are not adjustable.

The foregoing detailed description is to be clearly understood as given by way of illustration and example only, the spirit and scope of the invention being limited solely by the appended claims.

I claim:

1. In combination with a guitar having a plurality of spaced and generally parallel strings mounted in tensioned relationship over a body, said strings lying generally in a plane substantially parallel to the face of said body, a mute or damper for said strings, said mute or damper comprising:

a plurality of spring fingers each associated with one only of said strings,

damper means mounted on each of said spring fingers for engagement with said associated one of said strings,

means to mount said spring fingers on said body in such relationship that each of said damper means engages one of said strings,

said mounting means being pivotally mounted on said body,

adjustable means to bend each of said spring fingers by a predetermined desired amount serving to regulate the pressure exerted by the associated damper means against the associated string whereby to control the degree of muting thereof, and

means to pivot said mounting means and thereby simultaneously vary the relationships between all of said damper means and the associated strings.

2. A bass guitar or the like, which comprises:

a body having a face,

a plurality of spaced and generally parallel guitar strings mounted in tensioned relationship over said body,

said strings lying generally in a plane substantially parallel to said face,

a mounting element mounted on said body and having an edge region extending generally parallel to said plane and generally transverse to said strings,

a plurality of spring fingers extending from said edge region to the vicinity of said plane of said strings between said plane and said face,

each of said spring fingers comprising a spring the distal end of which is located in said vicinity and the base end of which is located adjacent said edge region,

said base end of said spring fingers being shaped as a hook and having a portion inserted between said edge and said face,

resilient mute or damper means mounted on the distal ends of said spring fingers for engagement with corresponding ones of said strings, and

a screw inserted through each of said spring fingers and threaded through said mounting element,

said screw being so related to the associated spring finger that turning of said screw effects adjustment of the bias exerted by said resilient means against the string corresponding to said associated spring finger.

3. The invention as claimed in claim **2**, in which each said spring fingers is a spring which, when in its natural or free condition, is bent upwardly from said mounting element by an amount greater than that permitted by the head of the associated screw, whereby said spring bears resiliently against said head and will remain in engagement therewith during and after turning of said screw to various adjusted positions.

4. The invention as claimed in claim **2**, in which each of said spring fingers comprises an elongated spring having a depressed or fulcrum portion engaged with the upper surface of said mounting element, and in which said screw is threaded downwardly into said mounting element at a region between said fulcrum portion and said resilient mute or damper means.

5. The invention as claimed in claim **2**, in which all of said spring fingers comprise flat springs integral with a base portion having said hook formed thereon, said springs and said base portion being formed from a single flat metal member.

6. The invention as claimed in claim **2**, in which said mounting element is pivotally mounted on said face for pivotal movement about an axis generally parallel to said plane and transverse to said strings, and in which means are provided to effect pivotal movement of said mounting element about said axis to thus adjust simultaneously the positions of said spring fingers relative to said strings.

7. The invention as claimed in claim **2**, in which a vertically-adjustable bridge is mounted on said body adjacent said resilient mute or damper means, said bridge engaging and supporting said strings.

8. A mute or damper device for a bass guitar or similar stringed instrument, which comprises:

a pivot element adapted to be pivotally mounted adjacent the face portion of a guitar body,

a crank member pivotally connected to said pivot element,

step-plate means adapted to be mounted on the face of the guitar and to support the end of said crank member remote from said pivot element, whereby the pivoted position of said pivot element is determined by the portion of said step-plate means on which said crank member is supported, and spring means mounted on said pivot element and having damper means on the ends thereof for resilient engagement with the strings of a guitar.

9. The invention as claimed in claim **8**, in which means are provided to adjust individual portions of said spring means to thus vary the pressure exerted by said damper means against each individual guitar string.

10. The invention as claimed in claim **8**, in which spring means are provided between said body and said pivot element to bias said pivot element in such direction that said crank member remains in engagement with said step-plate means.

11. The invention as claimed in claim **10**, in which pivotal mounting means for said pivot element are provided in the form of screws adapted to be inserted into a guitar body through oversize openings in said pivot element.

12. The invention as claimed in claim **8**, in which said step-plate means includes a plurality of flat edge regions adapted when said step-plate means is mounted on the face of a guitar body to be disposed progressively-increasing distance from said face.

13. The invention as claimed in claim **12**, in which portions of said step-plate means between said flat regions are inclined whereby to provide a cam-like action relative to said crank member during shifting of said crank member between different ones of said flat regions.

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U.S. Cl. X.R.

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