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G. S. COMPTON ET AL

3,538,233

ELECTRIC BASS GUITAR AND ELASTOMERIC BRIDGE THEREFOR

Filed Nov. 14, 1967

3 Sheets-Sheet 1

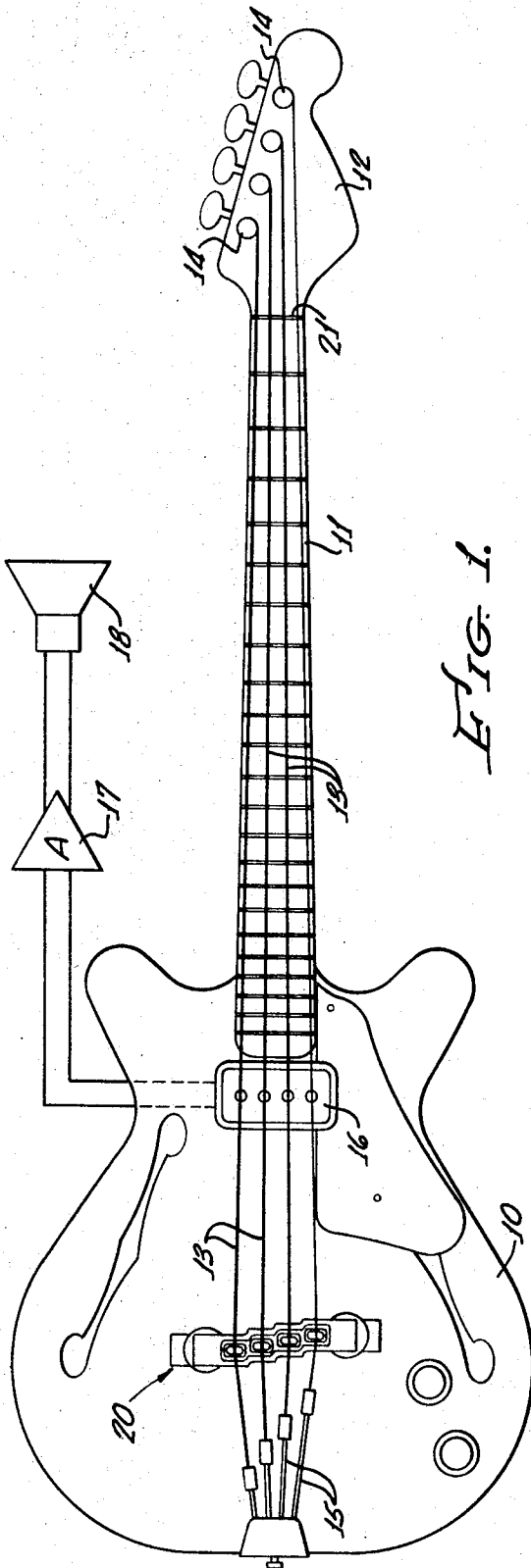
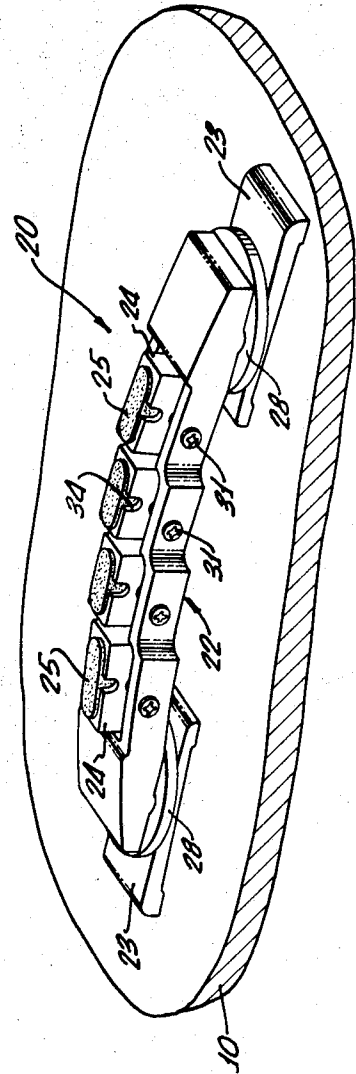


FIG. 1.

FIG. 2.



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3 Sheets-Sheet 2

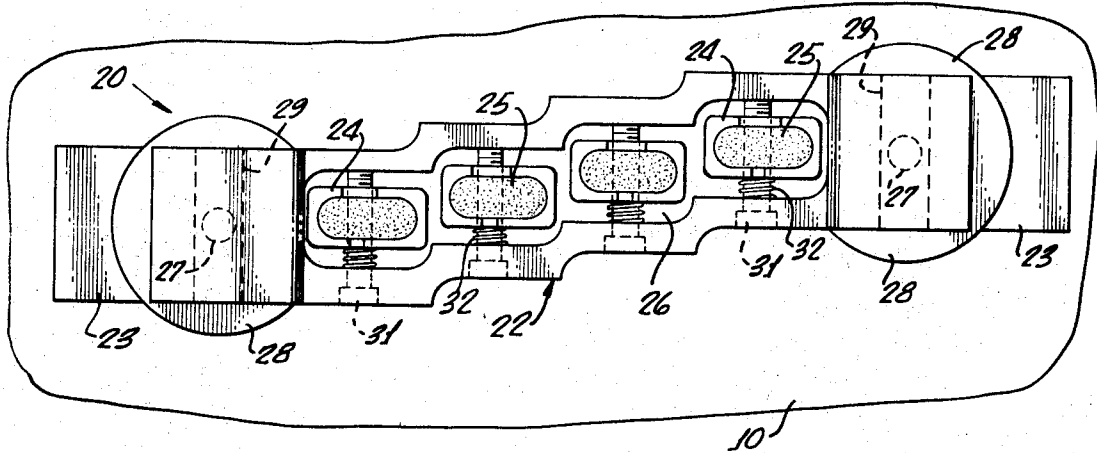


FIG. 3

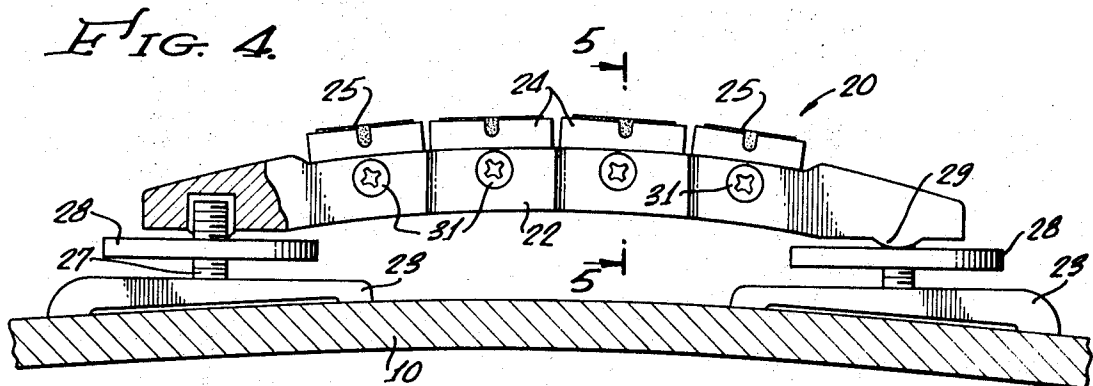


FIG. 4

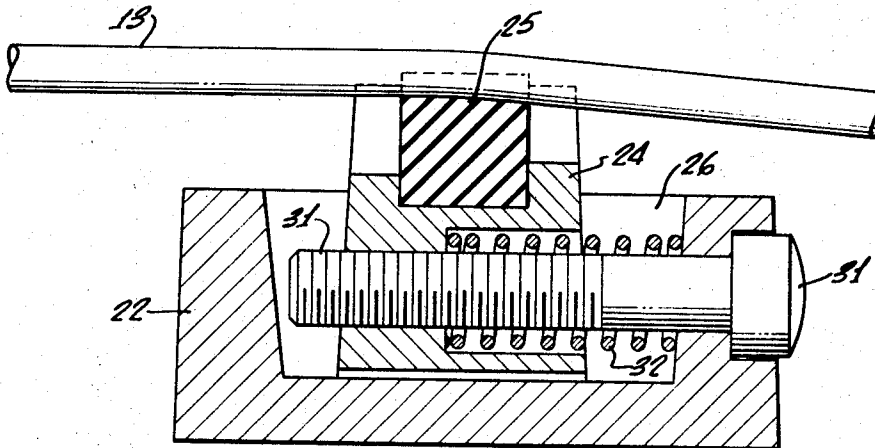


FIG. 5.

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3 Sheets-Sheet 3

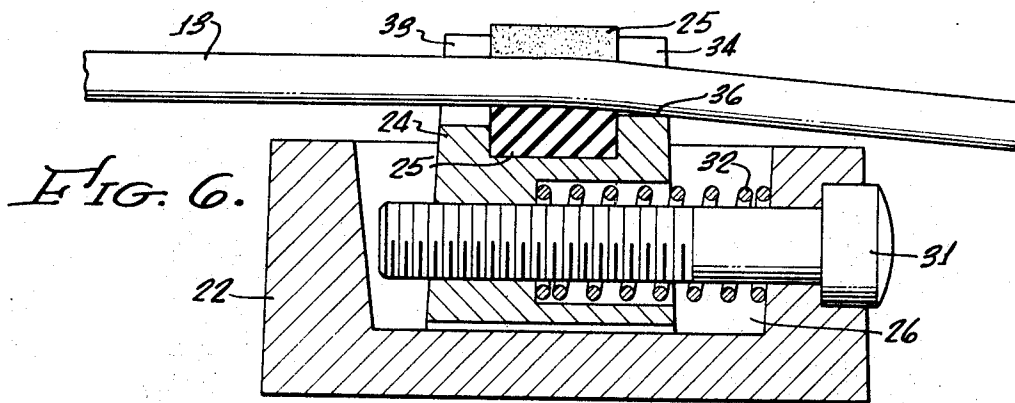


FIG. 6.

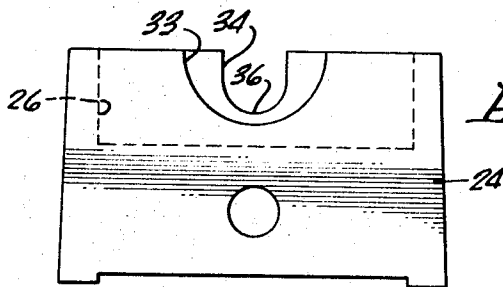


FIG. 8.

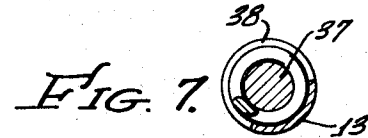


FIG. 7.

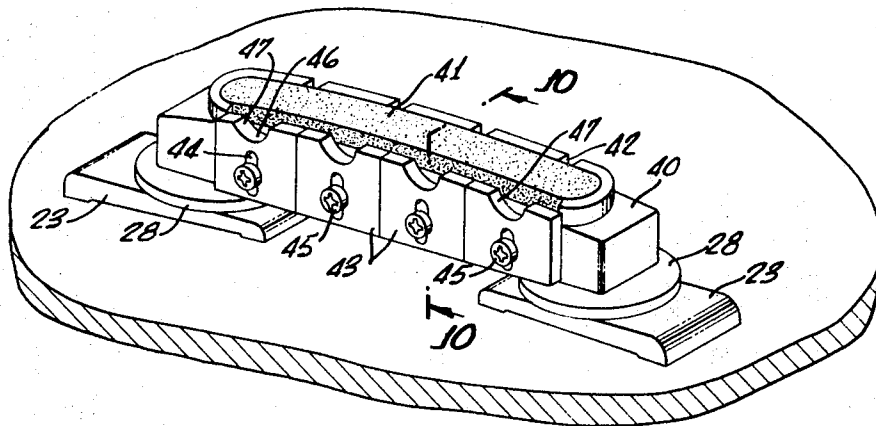


FIG. 9.

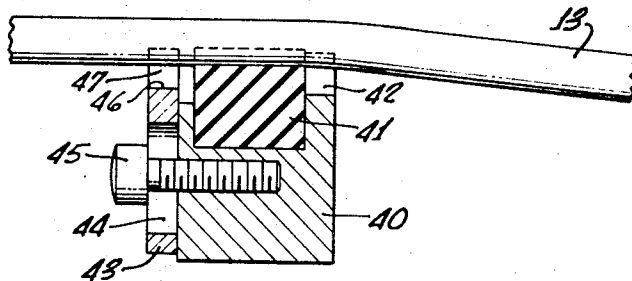


FIG. 10.

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1

3,538,233

ELECTRIC BASS GUITAR AND ELASTOMERIC BRIDGE THEREFOR

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U.S. Cl. 84-1.16

24 Claims

ABSTRACT OF THE DISCLOSURE

An electric bass guitar in which the string-engaging portions of the bridge are formed of an elastomeric material such as rubber. Adjustable mounting means are provided for the elastomeric material and incorporate auxiliary bridge portions so related to the elastomeric material that only a certain amount of compression of the latter is possible, despite aging and other effects, the elastomeric material remaining operative to provide muting action.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to the field of electric bass guitars, in which the vibration of the strings is sensed by a transducer and amplified for transmission to a loudspeaker. The invention also relates to the field of bridges for such electric bass guitars.

Description of the prior art

Prior-art electric bass guitars are conventionally provided with soft muting elements which engage the strings at a region relatively adjacent the bridge. More specifically, the muting means normally engages the operative playing portions of the strings at a region adjacent the primary bridge and between such primary bridge and nut of the guitar. Such mutes are characterized by several basic disadvantages, one of which is that a very substantial pressure must be exerted against the strings if effective muting is to be achieved. The creation of such substantial muting pressure against the strings tends to result in the setting up of a second fundamental with related higher harmonics. Such second fundamental and harmonics are not musically or harmonically related to the primary fundamental and its associated harmonics, the result being a musical condition which tends to be somewhat discordant.

Another important disadvantage of prior-art electric bass guitars is that the sound generated by an acoustic contrabass (double bass), when plucked by a jazz musician, is not simulated to the extent desired by many musicians.

In the field of relatively high-pitched bowed acoustic instruments, as distinguished from low-pitched plucked electrical instruments, it is known to provide rubber elements between the bridge and strings. More specifically, reference is made to British Pat. No. 450,363 for Improvements in or Relating to an Accessory for Stringed Musical Instruments, issued July 16, 1936. Such British patent, which specifies a violin, employs the rubber elements in order to eliminate the metallic twang which results primarily when metal strings of fine caliber are used on the violin. The specified purpose of the rubber pads is also to prevent cutting of the bridge by the wire strings.

SUMMARY OF THE INVENTION

In accordance with the present invention, the relatively large-diameter strings of an electric bass guitar are caused to rest upon bridge elements formed by relatively thick saddles or pads of a vibration-damping elastomeric

2

material such as a synthetic or natural rubber. When the vibrations of the plucked strings are sensed by transducers and transmitted in amplified form to loudspeakers, the resulting sounds are surprisingly similar to those generated by an acoustic contrabass when plucked as by a jazz musician. Means are provided to prevent complete loss of effectiveness of the saddles despite aging of the elastomeric material. Furthermore, means are provided to confine the elastomeric material to prevent excessive flow thereof. In addition, the present invention also provides adjustment means for the elastomeric saddles, permitting both vertical and horizontal adjustments.

In view of the above, it is the primary object of the present invention to provide an electric bass guitar, and bridge therefor, which effectively simulate an acoustic contrabass.

Another object is to provide an electric bass guitar, and bridge, incorporating means to insure that aging of the elastomeric material does not completely destroy the effectiveness thereof, and also incorporating means to confine the elastomeric material.

A further object is to provide an electric bass guitar, and bridge, which incorporate adjustment means to change the effective lengths of the strings as well as the elevation of the bridge elements above the face of the instrument.

A further object is to provide an electric bass guitar wherein means are provided to permit shifting from an elastomeric-bridged instrument to a rigid-bridged instrument during periods when it is desired to create special sound effects less closely simulative of an acoustic contrabass.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevational view of an electric bass guitar incorporating a bridge constructed in accordance with the present invention;

FIG. 2 is a perspective view of the bridge portion of the guitar of FIG. 1;

FIG. 3 is an enlarged top plan view of the bridge;

FIG. 4 is an elevational view of the bridge;

FIG. 5 is an enlarged transverse sectional view taken along line 5-5 of FIG. 4, and showing the relationship which occurs when the elastomeric material is relatively new;

FIG. 6 is a view corresponding generally to FIG. 5 but illustrating the relationship which occurs after aging of the elastomer;

FIG. 7 is an enlarged transverse sectional view of one of the strings of the bass guitar;

FIG. 8 is a view showing in front elevation one of the cups or receptacles for the elastomeric elements, and prior to mounting of an elastomeric element therein;

FIG. 9 is a perspective view corresponding generally to FIG. 2 but illustrating a second embodiment wherein means are provided to form rigid auxiliary bridges for use during periods when it is desired to create special sounds less closely simulative of those generated by a plucked contrabass; and

FIG. 10 is a sectional view on line 10-10 of FIG. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The expression "electric bass guitar" as employed in the present specification and claims denotes both solid-body and hollow-body electric bass guitar, such guitars incorporating suitable mechanical-electrical transducer means for sensing the string vibrations and transmitting the resulting electrical signals to amplifiers and loudspeakers. Although a hollow-body electric bass guitar has certain acoustic properties, and is sometimes referred to as acoustic-electric, it is vastly different from an acoustic contra-

3

bass (double bass) in that its acoustic properties are highly limited. Thus, for example, the wood elements forming the face and back of an acoustic-electric bass guitar are normally relatively thick in comparison to an acoustic contrabass. Furthermore, the size and volume of the body of a hollow-body electric bass guitar are vastly smaller than in the case of an acoustic contrabass.

Referring first to FIG. 1, an electric bass guitar is illustrated as having a hollow body 10, a fretted neck 11 extending from one edge portion of the body, and a head 12 provided at the end of the neck remote from the body. A plurality of relatively large-diameter, high-density strings 13 are mounted in stretched or tensioned condition over the body 10 and over the neck 11, being stretched between tuning screws 14 on head 12, and tail elements 15 which are provided on the body at the edge thereof opposite the neck. The number of strings 13 is conventionally four, although other numbers (such as five) may be employed.

In the illustrated guitar, the mechanical-electrical transducer is of the magnetic type, comprising a magnetic pickup which is shown at 16 as mounted on the face of body 10. The pickup 16 senses the vibrations of the strings 13 of the instrument, and generates currents which are transmitted to an amplifier 17 and thence to a loudspeaker 18. The strings 13 are magnetizable, being normally formed with steel cores which are wrapped as will be indicated in connection with FIG. 7. Other forms of pickups may be employed, for example piezoelectric pickups associated with one or both of the bridges of the instrument.

Strings 13 are stretched over the bridge 20 which forms a major component of the present invention, the bridge being mounted on the face of body 10 between tail elements 15 and the pickup 16. A second or auxiliary bridge is provided at the end of the neck remote from the body, being indicated at 21 and conventionally known as the nut. The bridges are so constructed that the strings 13 lie generally in a plane parallel to the face of body 10, and also generally parallel to each other. However, the strings frequently do not lie precisely in a plane but instead on the surface of a large-diameter imaginary cylinder having its axis longitudinal to the neck and spaced a substantial distance therebeneath.

The bridge 20 is illustrated to comprise an arcuate channel element 22 (FIG. 4) which is supported on feet 23 for vertical adjustment relative thereto. Adjustably mounted in the channel 22 are a plurality of cup elements 24, one for each of the guitar strings 13. Each cup 24 holds a saddle or pad element 25 formed of elastomeric material, in such relationship that a guitar string 13 is supported solely by the elastomeric saddle element and does not normally rest on any portion of the cup or channel elements 24 and 22.

Channel element 22 is illustrated to comprise a rigid metal casting having an elongated recess 26 in the upper portion thereof for reception of the cup elements 24. The interior walls of the side flanges of channel element 22 are sufficiently far from each other that the saddle elements 25 may engage the various strings 13 at such points that the effective string lengths are different. This is done so that the pitches of the sounds generated by the musician in plucking the strings 13 will be as desired, regardless of the fret on neck 11 which is engaged. The channel may, if desired, be inclined at an oblique angle to the strings. The end regions of channel 22 are shown as being solid and disposed above feet 23.

The feet or bass elements 23 are shaped generally as inverted channels, being adapted to rest firmly upon the upper surface of the face of body 10 at the desired location along the lengths of the strings 13. Extending upwardly from each of the feet 23 is a threaded stud 27 (FIG. 4) having a large-diameter flat nut 28 threaded thereon. Each stud 27 projects upwardly into an over-size and unthreaded recess (FIG. 4) in an end of the

4

channel 22, so that the channel 22 may move upwardly and downwardly relative to the stud. Accordingly, the vertical position of each end of the channel 22 is determined by the position of nut 28 on the stud, which may be varied as desired by rotating the nut.

The portion of each end of the channel which rests on the upper surface of a nut 28 is elongated longitudinally of the axis of the guitar, as indicated at 29 in FIG. 3. Referring to the right side of FIG. 4, the lower surface of each portion 29 is rounded to permit a certain amount of pivotal action.

With the described construction, the channel element 22 may be moved vertically in order to change the elevation of the strings above the face of the guitar body, and also to compensate for the effects of aging of the saddle elements 25 as will be discussed. If desired, one end of the channel 22 may be at a different elevation than the other.

Each of the cup elements 24 is also illustrated as being a casting of a suitable metal. The lower or bottom wall of each cup 24 is very thick, having at its lower surface downwardly protuberant foot portions (FIG. 8) which rest upon the bottom wall of the channel recess 26. The width of each cup 24 is much less than that of the recess 26 within the channel, permitting adjustment of each cup longitudinally of its associated string 13 in order to change the effective length of the latter. Such adjustment is effected by means of a horizontal screw 31 which is inserted rotatably through one of the flanges (the one adjacent the tail elements 15) of channel 22.

Each adjustment screw 31 is threaded through the thick bottom wall of an associated cup 24 as illustrated in FIGS. 5 and 6. The bore in each cup 24, and which receives the screw in threaded relationship, is counterbored to receive a portion of a helical compression spring 32. Such spring is seated between the cup and the adjacent flange in order to insure against unintentional shifting of the cup and its associated saddle.

With the described construction, rotation of a screw 31 in either direction effects a corresponding shifting of the associated saddle longitudinally of the string 13 supported thereby.

The upper or recessed region of each cup element 24 is elongated in a direction transverse to each string 13, being shaped to receive one of the elastomeric saddle elements 25 which is similarly elongated. The saddle elements 25 are relatively thick, as will be described, being shown as protruding upwardly from the bottom of the recess in each cup to a location generally flush with or slightly above the rim of the cup.

The cups receive the saddle elements 25 in relatively snug-fitting relationship, thus confining the elastomeric material and minimizing its tendency to spread or flow. Accordingly, the ability of each string 13 to press downwardly into the saddle therefor is reduced to a minimum.

Referring particularly to FIGS. 5, 6 and 8, each cup 24 is provided at its upper or rim regions with aligned notches 33 and 34 through which the associated guitar string 13 is adapted to extend when resting upon the saddle 25. The first such notch, number 33, is relatively adjacent the neck 11 of the guitar and is sufficiently large that the cup is never engaged by the operative playing portion of a guitar string 13. In the illustrated form, such notch 33 is somewhat semicircular. The operative playing portion of the string is that portion between the bridge 20 and the nut 21, as indicated above, being shown (in part) at the left in FIGS. 5 and 6.

The second notch, number 34, is more narrow and also more shallow than the first-mentioned notch 33, being adjacent the tail elements 15. The vertical walls of each notch 34 are parallel to each other and provide guiding functions which locate the associated strings 13 and maintain the same in proper positions on their respective saddles 25. The bottom wall 36 of each notch 34 is rounded, being adapted to be engaged by an associated string 13 in the event that aging of the elastomeric ma-

terial 25 causes a downward movement of the string 13 until such bottom notch wall 36 is engaged as shown in FIG. 6. When the bottom wall 36 is engaged, the effectiveness of the present bridge in permitting simulation of acoustic contrabasses is much diminished since each string 13 is no longer supported solely by the elastomeric material 25. However, such bottom notch wall 36 permits a certain degree of muting to be achieved despite the fact that a particular musician neglects to replace the elastomeric saddles 25 after aging thereof has become excessive. The musician should replace the elastomeric blocks 25 periodically, as may be done in very simple and economical manner, in order to prevent occurrence of the condition represented by FIG. 6.

The bass guitar strings 13 which are supported by the saddle elements 25 are relatively large in diameter and are tuned to generate bass notes, normally having magnetizable cores 37 and suitable wrappings 38 as illustrated in FIG. 7. Such large-diameter strings do not cut the saddle elements 25 but may tend to move downwardly, toward the position shown in FIG. 6, after aging has occurred. The strings have high linear densities, that is to say high weight per unit length, in order that the generated sounds will be low pitched.

FURTHER DESCRIPTION OF THE SADDLE ELEMENTS 25, AND OPERATION

As stated above, each saddle 25 is formed of an elastomeric material such as a synthetic or natural rubber. "Neoprene" synthetic rubber, having a shore hardness of on the order of eighty, has been found to be highly satisfactory.

It is emphasized that if the elastomeric material forming each saddle 25 is too hard, there will be insufficient compliance, etc., to permit achievement of the objects of the present invention. Such a hard bridge would then be similar to prior-art bass guitars having bridges of hard metal, fiber, etc. On the other hand, the elastomeric material forming each saddle 25 must not be so soft that it will not function as the bridge. Excessive softness also permits the strings 13 to move downwardly undesirably far into the elastomeric material.

The thickness of each saddle 25 is very substantial, being greater than the diameter of the string 13 supported thereon. Such thickness is preferably at least fifty percent greater than the diameter of the supported string.

Preferably, the upper surface of each saddle 25 is directly in contact with the string supported thereby. The purposes of the present invention would be destroyed if any massive element were interposed between each string and the supporting elastomeric saddle or pad 25.

In the operation of the electric bass guitar and the bridge 20 thereof, the musician may adjust the operative length of each string 13 by merely turning the related screw 31 until the proper intonation is achieved at different fret positions. The strings 13 are caused to be at the desired heights above the neck 11, and above the face of the body 10, by turning the nuts 28 (FIG. 4) to raise or lower the bridge channel 22.

When a string 13 is first plucked, it is normally in a direction generally parallel to the face of body 10. However, very shortly after plucking the string rotates to a plane of vibration transverse to such face, being toward and away from the electromagnetic transducer or pickup 16 (FIG. 1). Such pickup 16 senses the vibrations of the magnetizable strings 13, converting the same into electric signals which are amplified by amplifier 17 and transmitted to loudspeaker 18.

One highly important result achieved by the present invention is that, for a given degree of plucking, the initial amplitude of the sound wave which emanates from loudspeaker 18 is greater with the present instrument than with electric bass guitars incorporating rigid bridges. In addition, the initial rate of decay of the amplitude of

the sound wave is much greater with the present instrument than with conventional rigid-bridge electric bass guitars.

The greater initial amplitude of the sound wave is believed to be the result of the initial upward and downward movement of the portion of each string 13 which is directly over and supported by a saddle 25, such upward and downward movement being permitted by the compliance, compressibility and resilience of the relatively thick saddle. Because each string 13 moves upwardly and downwardly on its saddle 25, all portions of the string also move upwardly and downwardly a greater distance than in the case of strings supported by rigid bridges, creating a greater relative movement relative to the pickup 16 with consequent increase sound amplitude.

The greater initial rate of decay of the sound wave generated by the present instrument, in comparison to sound waves from prior-art instruments incorporating rigid bridges, is believed to result from the absorbing by the elastomeric saddles 25 of the higher harmonics (in particular) present in the strings 13. Since the total amplitude is dependent upon the summation of the amplitudes of the various harmonics, the absorbing of the harmonics by the saddles 25 results in rapid initial decay of the generated sounds. It is pointed out, however, that after the rapid initial decay occurs, the strings 13 have a high degree of sustaining power, or dwell, this being because the fundamental and lower harmonics are affected by the rubber saddles 25 to a much lesser degree (from a standpoint of attenuation) than are the higher harmonics.

Another result from the fact that the portion of each string 13 which rests upon a saddle 25 moves upwardly and downwardly, due to the compliance or elasticity of the saddle, is that the effective length of the string appears to be lengthened momentarily. Such momentary effective lengthening of the string tends to reduce the initial pitch for a very brief period of time.

All of the above-described effects contribute toward making the present instrument much more simulative of a conventional acoustic contrabass than is any electric bass guitar known to the art. Many musicians, upon hearing the present instrument, have expressed surprise that it is possible to simulate the sound of a plucked contrabass so realistically. The above-indicated desirable results are achieved without causing the dissonant effects which tend to be created by conventional prior-art mutes which engage the strings at points between the two bridges. As indicated heretofore, such prior-art mutes tend to set up reflected waves, or second fundamentals and associated harmonics, which are not musically related to the fundamental and harmonics generated by the string portions between the two bridges. In the present instrument there is only one fundamental, that between each elastomeric saddle 25 and the nut 21 (FIG. 1), there being no second element engaging the strings.

As previously described, aging of the rubber saddles 25 may eventually cause downward shifting of a string 13 until the notch surface 36 (FIG. 6) is engaged. Many beneficial effects of the present invention are then lost, but the instrument does remain operative at least to the extent of prior-art instruments. The surface 36 then acts as a rigid bridge, whereas the adjacent elastomeric material 26 acts as a mute.

It is pointed out that the elements 25 may be termed the "primary" bridge means since they normally provide the sole support (other than the remaining bridge or nut 21) for strings 13. The lower notch walls 36 (FIG. 6) may be termed the "secondary" bridge means since they may become operative after the elastomeric material has aged. It is further pointed out that a conventional mute may, if desired by a particular musician, be employed to engage the operative playing portions of the strings, but such an arrangement is not preferred.

EMBODIMENT OF FIGS. 9 AND 10

In the embodiment of FIGS. 9 and 10, an elongated channel 40 is adjustably supported on the elements 23, 27 and 28 as discussed in connection with the previous embodiment. The channel 40 is shown as receiving a single elongated bar or mass 41 of the elastomeric material discussed above. It is to be understood, however, that means may be provided to effect adjustment of various portions of the mass 41 longitudinally of the strings 13 as described heretofore.

The region of the channel 40 remote from the neck of the instrument is generally flush with the upper surface of the elastomeric material 41, being provided with a plurality of notches 42 which correspond generally to the notches 34 of the previous embodiment. As in the case of the previous embodiment, such notches 42 serve to position the strings 13 at the desired spacings or distances of separation. The vertical walls of notches 42 (and 34) do not interfere with the musical qualities of the instrument since they engage only the inoperative portions of the strings between bridge and tail piece, instead of the operative playing portions between the two bridges.

The region of channel 40 which is relatively adjacent the neck is not provided with stationary notches as in the previous embodiment, but instead with adjustable notch and bridge elements or plates 43, one for each of the strings 13. Such elements 42 are illustrated as being generally rectangular in shape, and as having vertically elongated slots 44 therein for reception of screws 45 which extend horizontally and are threaded into the channel 40 beneath the elastomeric material 41.

By loosening the screws 45 and then adjusting the elements 43 upwardly, for example prior to the time that the strings are tightened by means of the tuning screws 14 (FIG. 1), the musician may adapt the instrument for achievement of special sound effects not so closely simulative of an acoustic contrabass. Stated otherwise, the elements 43 are adjusted upwardly until the bottom walls 46 of the notches 47 therein forceably engage the undersides of the strings 13 (after the latter are tightened), such walls 46 serving as rigid bridges.

It is emphasized that the embodiment of FIGS. 9 and 10 is only for the achievement of special sound effects desired by some musicians playing electric bass guitars, and permits the instrument to be converted from one which closely simulates an acoustic contrabass to one which achieves other and less closely simulative sound effects sometimes desired by some musicians.

Instead of or in addition to providing the notched elements 43 on the face of channel 40 which is adjacent the neck, such elements 43 may be provided on the face adjacent the tail piece. This permits the musician to adapt the instrument for the muted bass sounds characteristic of prior-art instruments, particularly when it is desired to produce special effects not so closely simulative of the acoustic contrabass. It is to be understood that the elevation of the notched plates 43 may, if desired, be accomplished by quick-change means, not shown.

It is also within the scope of the invention to provide rigid elements, which are vertically movable, and which are between spaced but parallel portions of the elastomeric element 41, in order that the effective string lengths will not be altered when the rigid elements are shifted upwardly into engagement with the strings for purposes of achieving special effects. In addition, means may be provided to lower the elastomeric element 41 instead of, or in addition to, raising the notched metal elements when special effects are desired.

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

We claim:

1. An electric bass guitar, which comprises:
a body having a neck extending therefrom,

a plurality of guitar strings connected to said body and to said neck and extending thereover in tensioned relationship,

said strings being adapted for plucking only,

said strings being relatively large in diameter and being tuned to generate bass notes,

mechanical-electrical transducer means to sense the vibrations of said strings and transmit the resulting electrical currents to amplifier and loudspeaker means, and

bridge means provided on said body and engaging said strings to maintain the same in supported condition above said body and to define the operative playing portions of said strings,

said bridge means including elastomeric means which are disposed closely adjacent said strings and form the primary string-supporting portions of said bridge means,

said elastomeric means being in direct engagement with said strings.

2. The invention as claimed in claim 1, in which said elastomeric means are formed of rubber having a shore hardness on the order of eighty.

3. The invention as claimed in claim 1, in which the thickness of said elastomeric means is greater than the diameter of the string supported thereby.

4. The invention as claimed in claim 3, in which the thickness of said elastomeric means is on the order of at least fifty percent greater than the diameter of the string supported thereby.

5. The invention as claimed in claim 1, in which said strings have high linear densities, and in which said elastomeric means are at least substantially thicker than the diameters of the strings supported thereby and are in direct engagement with said strings.

6. The invention as claimed in claim 1, in which said strings are at least partially formed of magnetizable material, and in which said transducer means is electromagnetic.

7. The invention as claimed in claim 1, in which nothing is in engagement with any of said strings at any point between the bridge means at opposite ends thereof.

8. An electric bass guitar, which comprises:

a body having a neck extending therefrom,

a plurality of guitar strings connected to said body and to said neck and extending thereover in tensioned relationship,

said strings having large diameters and high linear densities, and being tuned to generate bass notes,

mechanical-electrical transducer means to sense the vibrations of said strings and transmit the resulting electrical currents to amplifier and loudspeaker means, and

bridge means provided on said body and engaging said strings to maintain the same in supported condition above said body and to define the operative playing portions of said strings,

said bridge means comprising:

base means provided on said body,

support means provided above said base means,

adjustment means to vary the elevation of said support means relative to said base means, and

elastomeric string-engaging means mounted on said support means and in direct supporting engagement with said strings to provide at least the primary support therefor.

9. The invention as claimed in claim 8, in which the dimension of said elastomeric means extending between said strings and said support means is substantially greater than the diameter of any of said strings.

10. The invention as claimed in claim 8, in which said support means includes a channel element mounted gen-

erally parallel to the face of said body and extending transversely to said strings.

11. The invention as claimed in claim 8, in which a separate one of said elastomeric string-engaging means is provided for each of said strings, and in which means are provided on said support means to adjust said elastomeric means longitudinally of said strings to thereby alter the operative lengths thereof.

12. The invention as claimed in claim 8, in which said support means includes a channel element mounted generally parallel to the face of said body and extending transversely to said strings, in which a plurality of cup elements are movably mounted on said channel element between the flanges thereof, in which adjustment screws are connected between said cup elements and at least one of said flanges and are oriented longitudinally of said strings in order to effect adjustment of said cup elements longitudinally thereof, and in which said elastomeric string-engaging means is a single bar of elastomeric material formed of elastomeric material and mounted one in each of said cup elements.

13. The invention as claimed in claim 8, in which said support means includes a channel element mounted generally parallel to the face of said body and extending transversely to said strings, and in which said elastomeric string-engaging means is a single bar of elastomeric material mounted between the flanges of said channel element and engaging all of said strings.

14. The invention as claimed in claim 8, in which means are provided to prevent more than a predetermined amount of movement of any string downwardly into said elastomeric means.

15. An electric bass guitar, which comprises:

a body having a neck extending therefrom,

a plurality of guitar strings connected to said body and to said neck and extending thereover in tensioned relationship,

mechanical-electrical transducer means to sense the vibrations of said strings, and

bridge means provided on said body and engaging said strings to maintain the same in supported condition above said body and to define the operative playing portions of said strings,

said bridge means further comprising confining material in supporting engagement with said strings and having a thickness greater than the diameter of any of said strings,

said bridge means further comprising confining means to confine said elastomeric material and prevent excessive flow thereof as the result of the downward pressure exerted by said strings.

16. The invention as claimed in claim 15, in which the walls of said confining means are provided with two opposed notches for each of said strings, one of each set of said notches being relatively narrow and having a lower wall located a substantial distance above the lower surface of said elastomeric material, the other of each set of said notches being wider and deeper than said one notch, said one notch in each set being disposed relatively remote from said neck in order that said elastomeric material will effectively engage a string when such string engages said lower wall of said one notch, said other notch in each set being adjacent said neck and being sufficiently large that the wall thereof never engage said string.

17. An electric bass guitar, which comprises:

a body having a neck extending therefrom,

a plurality of guitar strings connected to said body and to said neck and extending thereover in tensioned relationship,

mechanical-electrical transducer means to sense the vibrations of said strings and transmit the resulting electrical currents to amplifier and loudspeaker means, and

bridge means provided on said body and engaging said strings to maintain the same in supported condition

above said body and to define the operative playing portions of said strings,

said bridge means including elastomeric means disposed closely adjacent said strings and forming at least the primary string-supporting portions of said bridge means,

said bridge means further including rigid bridge means adapted to support said strings and thereby render said elastomeric means relatively ineffective,

said bridge means further including means to effect relative movement between said elastomeric means and said rigid bridge means to such relative elevations above said body that first one and then the other is in primary supporting engagement with said strings.

18. A bridge for an electric bass guitar having a body, a neck and a plurality of strings connected to said body and neck and mounted thereover in tensioned relationship, said strings having relatively large diameters, which bridge comprises:

base means adapted to be mounted on the face of said body,

support means provided above said base means, and

elastomeric string-engaging means mounted on said support means for direct supporting engagement with said strings to provide at least the primary support therefor,

said elastomeric string-engaging means having a thickness substantially greater than the diameter of any of the strings to be supported thereon.

19. The invention as claimed in claim 18, in which said support means is a channel element adapted to be mounted generally parallel to the face of said body and transversely to said strings.

20. The invention as claimed in claim 18, in which a separate one of said elastomeric string-engaging means is provided for each of said strings, and in which means are provided on said support means to adjust said string-engaging means longitudinally of said strings to thereby alter the operative lengths thereof.

21. The invention as claimed in claim 18, in which said support means is a channel element adapted to be mounted generally parallel to the face of said body and transversely to said strings, in which a plurality of cup elements are mounted on said channel element between the flanges thereof, in which adjustment screws are connected between said cup elements and at least one of said flanges in order to effect adjustment of said cup elements longitudinally of said strings, and in which said elastomeric string-engaging means is a plurality of saddle members formed of elastomeric material and mounted one in each of said cup elements.

22. The invention as claim 18, in which said support means is a channel element adapted to be mounted generally parallel to the face of said body and transversely to said strings, and in which said elastomeric string-engaging means is a single bar of relatively soft elastomeric material mounted between the flanges of said channel element for engagement with all of said strings.

23. The invention as claimed in claim 18, in which means are provided to prevent more than a predetermined amount of movement of any string downwardly into said elastomeric means.

24. An electric guitar, which comprises:

a body having a neck extending therefrom,

a plurality of guitar strings connected to said body and to said neck and extending thereover in tensioned relationship,

mechanical-electrical transducer means to sense the vibrations of said strings and transmit the resulting electrical currents to amplifier and loudspeaker means, and

11

bridge means provided on said body and engaging said strings to maintain the same in supported condition above said body and to define the operative playing portions of said strings,

said bridge means including a primary string-supporting portion formed of elastomeric material,

said bridge means further including a secondary string-supporting portion formed of rigid material,

said secondary string-supporting portion being adjacent said primary portion and being sufficiently far below the upper surface of said primary portion that said secondary portion is not engaged by said strings until after aging of said elastomeric material.

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WARREN E. RAY, Primary Examiner

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84—307

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,538,233 Dated November 3, 1970

Inventor(s) George Stanley Compton and Grover G. Fields

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 9, line 19, cancel "single bar of elastomeric ma-" and substitute --- plurality of saddle members ---; line 44, cancel "further"; same line, cancel "confining" and substitute --- elastomeric ---; line 45, cancel "terial" and substitute --- material ---; line 64, cancel "wall" and substitute --- walls ---.

Signed and sealed this 8th day of June 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
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