Sept. 20, 1971 S. E. RENDELL 3,605,545

ADJUSTABLE BRIDGE FOR STRINGED MUSICAL INSTRUMENT

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Fig. 1

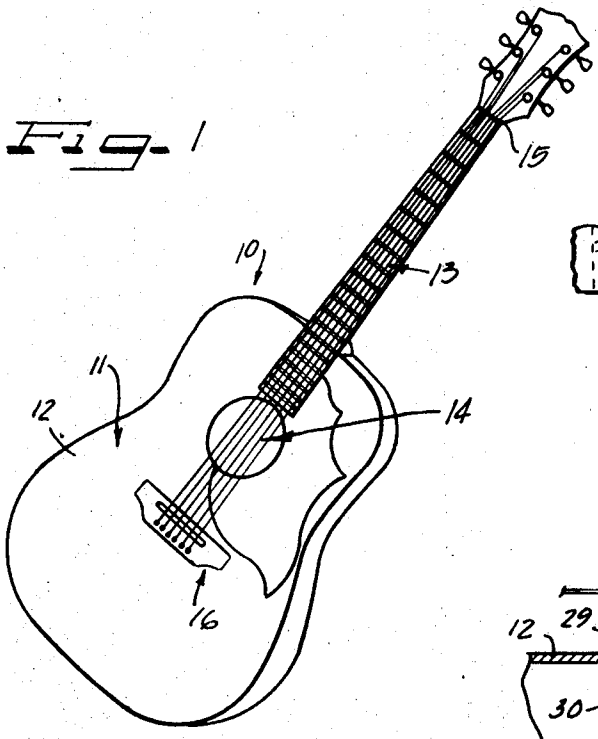


Fig. 4

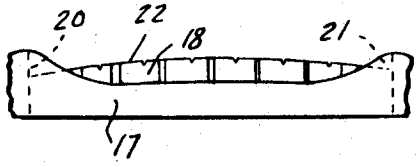


Fig. 3

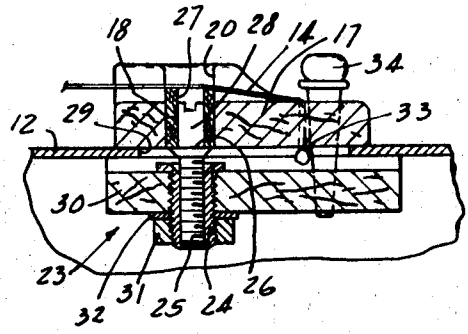
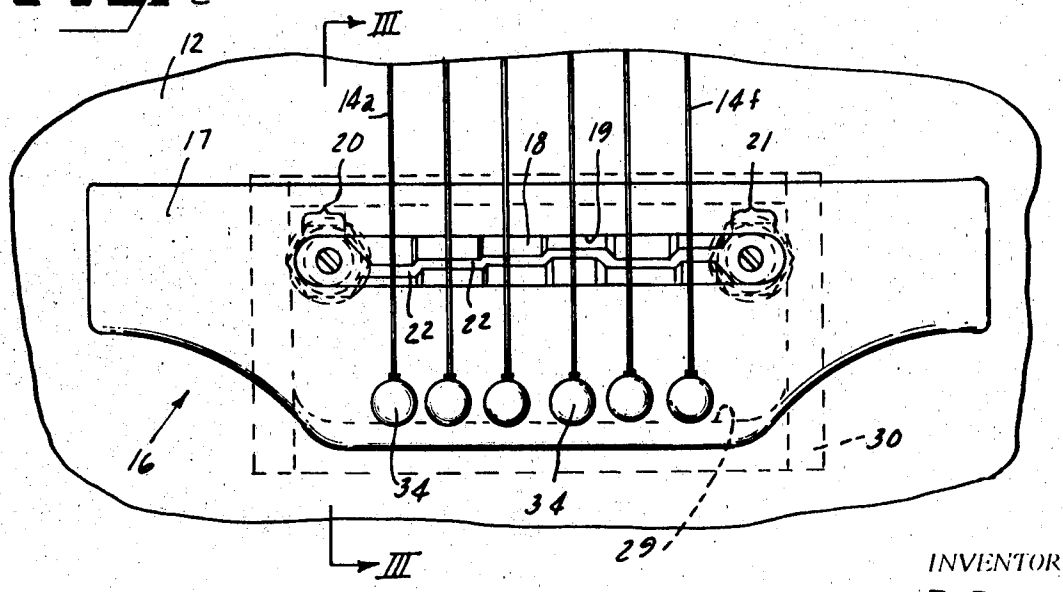


Fig. 2



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ADJUSTABLE BRIDGE FOR STRINGED MUSICAL INSTRUMENT

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ABSTRACT OF THE DISCLOSURE

A bridge, such as for a guitar, includes a rigid base that has an elongated recess in which there is slidably supported a saddle which supports the guitar strings. As the saddle is adjusted vertically, it is guided by a guide surface within the recess to preclude any rocking or cocking.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to a guitar construction, and more specifically to an adjustable bridge for a stringed musical instrument.

Prior art

When a wooden musical instrument such as a guitar is subjected to climate changes, particularly changes in humidity, the instrument changes physically owing to the many stresses that are present in a tuned strung instrument. Where the climatic change constitute an increase in humidity, the spruce top of the body would tend to warp or swell upwardly, that is in a direction toward the strings. Further, there would be some neck movement under those circumstances. These natural changes alter the string tensions, but more importantly alter the spacing between the strings and the frets. If the spacing is too close, then a plucked string will rattle against the fret, and if the spacing is too great, then the musician must press down too far, which is both uncomfortable and which could be causing unintentional tensioning and hence sharping. In an inexpensive guitar or similar musical instrument, nothing is done about the problem mentioned. As one gets to a more sophisticated guitar, there has in the past been provided a bridge which is adjustable in height so as to compensate for the instrument changes that are brought out by climatic changes.

Where the natural warpage has been significant or severe, the amount that the adjustable bridge must be moved could be considerable, and I have found that it has not been uncommon for the saddle of such bridge to cock or to rock slightly in a direction toward the fret board. While a cocked bridge saddle creates the appearance of poor workmanship, more significantly, it affects the information of the instrument. One illustration will suffice to dramatize this point. Assume that the scale length or speaking length of the string (the distance from the nut to the saddle) is 25.50 inches. Guitars are so constructed that the distance from the nut to the 12th fret is precisely one-half of the scale length or speaking length of the string. When a musician presses a string against the 12th fret, its length should be cut precisely in half so as to obtain a note one octave higher than the string is tuned for. Assume further that it has become necessary to raise the bridge saddle because of humidity changes. With the prior saddles where such raising is significant in amount, the saddle has cocked toward the frets, thereby decreasing the actual scale length or speaking length, whereby when the 12th fret is engaged, the note is no longer one octave higher, but slightly sharp as less than half of the speaking length is thus used. Thus, cocking of a bridge saddle

affects the intonation of all of the strings no matter which fret is used.

SUMMARY OF THE INVENTION

According to my invention, there is provided an adjustable bridge that includes a base and a saddle wherein the base is provided with a support or guide surface against which the saddle is always engaged for any normal position thereof so that even though there is extreme adjustment of the saddle position, there is no rocking, and the basic original intonation of the instrument is preserved.

Accordingly, it is an object of the present invention to provide a bridge for a stringed musical instrument employing a saddle that cannot rock.

A further object of the present invention is to provide a bridge that can be adjusted without having an effect on the intonation of the stringed musical instrument.

A still further object of the present invention is to provide a stringed musical instrument construction that can be compensated in response to climatic conditions without adverse effect on the intonation.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying drawing in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

FIG. 1 is a perspective view of a guitar provided with an adjustable bridge constructed in accordance with the principles of the present invention;

FIG. 2 is an enlarged plan view of the bridge portion of the guitar of FIG. 1;

FIG. 3 is a cross-sectional view taken along the line III—III of FIG. 2; and

FIG. 4 is an elevational view, partly broken away, of the bridge.

As shown on the drawing:

The principles of the present invention are particularly useful when embodied in a stringed musical instrument such as a guitar illustrated in FIG. 1, generally indicated by the numeral **10**. The guitar **10** includes a body **11** which typically has a spruce top **12**, a fret board **13** and a set of strings **14**. At one end, the strings **14** are secured to the peg head, and each extends over a guitar nut **15**, thence over the frets to a bridge **16**.

The bridge **16** includes a base **17** and a saddle **18**. The base **17** is rigid and is secured to the upper surface of the top **12**. The base **17** has an elongated recess **19** within which the saddle **18** is disposed. As viewed in FIG. 2, the portion of the base **17** lying to the left of the string **14***a*, and the portion of the base lying to the right of the string **14***f* is vertically enlarged, that is toward the viewer so that at the ends of the recess **19**, the means or portion of the base that define such recess are thickened somewhat, as further seen best in FIG. 4. Owing to the tension of the strings **14**, the saddle **18** tends to rock against one side of the recess **19**, and advantage is taken of this fact so that the ends of the recess **19**, and particularly the portions designated **20** and **21** constitute a guide surface. The guide surfaces **20** and **21** extend perpendicularly to the top **12** and have a vertical extent which is greater than the vertical extent of the adjacent or guided portion of the saddle, as best seen in FIG. 4. Thus, the recess **19** has effective portions at its opposite ends which provide snug guidance for the ends of the saddle **18**.

The saddle **18** has a number of string support surfaces which are notched to receive and guide the individual strings **14**. The upper surface of the saddle **18** may have a slight crown to it, and these surfaces **22** are normally

below the height of the upper end of the guide surfaces **20, 21** and are always below the upper end of the guide surfaces **20, 21** when the saddle is in its lowermost position. The saddle at its ends is thus in vertically sliding engagement with the base **17**. The saddle **18** is cut away or tapered in a wedgelike manner at each of the string support surfaces **22**, so while some guidance could possibly be provided at other portions of the recess **19**, as the vertical extent of the outer wall of the saddle **18** is somewhat abbreviated at the string support surfaces **22**, reliance is made for guidance on those portions of the saddle **18** that lie adjacent to the portions designated **20, 21**, namely those portions of the recess that encircle the ends of the saddle in a snug manner.

The bridge further includes threaded means **23** shown in FIG. 3 for raising and for supporting the saddle **18**. The threaded means **23** includes a threaded nut **24** and a threaded screw **25** for providing the adjustable support of the saddle. The screw **25** has a shoulder **26** on which the saddle **18** rests. The saddle **18** is apertured as at **27** in alignment with the screw **25** for reception of an adjusting tool. Further, the screw **25** is provided with a guide portion **28** which fits snugly in the saddle aperture **27** for augmenting the guidance of the end of the saddle **18**, particularly if the saddle is raised so that it projects considerably from the upper end of the guide support surfaces **20, 21**. Turning the screw **25** in one direction raises the saddle, and turning it in the opposite direction enables the strings **14** to force the saddle downwardly, maintaining its engagement on the shoulder **26**. Normally however, when the saddle **18** is moved to its upper position, there will be adequate guidance by the guide surfaces **20, 21** to prevent any cocking of the saddle.

The spruce top **12** has an aperture **29** which is completely overlaid by the base **17** and the threaded means **23**, and in particular the screw **25** thereof, extends through the aperture **29**. A support means **30** is secured to the lower surface of the top **12** at the aperture **29** and is also recessed. The nut **24** is secured by a further nut **31** and washer **32** to the support means **30** in a fixed position, and the upper end of its threaded bore is chamfered to receive a lower beveled surface of the shoulder **26**, thereby enabling the saddle **18** to be moved through the aperture **19**, substantially in engagement with the upper flanged end of the nut **24**. Each string **14** has a ball end **33** disposed in the aperture **29** and held therein by a slotted peg **34**.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A bridge for a stringed musical instrument, comprising:

(a) a rigid base for being secured to the top of the instrument in a fixed position, said base having means defining an elongated recess for extending transversely to the strings, said means including a guide surface for extending in a direction perpendicular to the top of the instrument;

(b) a saddle having string-supporting surfaces, said saddle being disposed in said recess in vertical sliding engagement with said guide surface, said guide surface having a vertical extent greater than the vertical extent of the adjacent portion of said saddle; and

(c) threaded means, for being supported by the guitar and having shoulder means adjustably supporting said saddle;

whereby said saddle is guided by said guide surface to prevent cocking thereof in response to being moved to an upper position by said threaded means.

2. A bridge according to claim **1**, in which said guide surface extends vertically higher than the adjacent string supporting surfaces on said saddle when said saddle is in a lower position.

3. A bridge according to claim **1**, in which said guide surface has an effective portion at opposite ends of said saddle by which said saddle is snugly guided in said recess.

4. A bridge according to claim **1**, in which the string supporting surfaces of said saddle are normally disposed vertically below the height of the upper end of said guide surface.

5. A bridge according to claim **1**, in which said base is vertically enlarged at the ends of said recess to provide said guide surface.

6. A bridge according to claim **1**, in which said threaded means includes:

(a) a nut for being supported by the top of the instrument;

(b) a screw threaded into said nut and having a shoulder engaging the lower side of said saddle; and

(c) said saddle being apertured in alignment with said screw for receiving an adjusting tool.

7. A bridge according to claim **6**, in which said screw has a guide portion fitting snugly in said saddle aperture.

8. In a stringed musical instrument having a body with a top, a fret board secured to said body, and a set of strings tensioned over said fret board, the improvement of an adjustable bridge which comprises:

(a) a rigid base secured to said top in fixed position beneath said strings, said base having means defining an elongated recess extending transversely to said strings, said means including a guide surface extending perpendicularly to said top;

(b) a saddle having string-supporting surfaces against which said strings are normally tensioned, said saddle being disposed in said recess in vertical sliding engagement with said guide surface, said guide surface having a vertical extent greater than the vertical extent of said saddle; and

(c) threaded means supported by said top and having shoulder means adjustably supporting said saddle.

9. A stringed instrument according to claim **8** in which said top has an aperture overlaid by said base, said threaded means extending through said aperture, and support means carried by said top within said body and supporting said threaded means.

10. A stringed instrument according to claim **9** in which said saddle is movable partially into said aperture.

References Cited

UNITED STATES PATENTS

897,964	9/1908	De Julio	84—298
2,918,837	12/1959	Webster	84—312
2,972,923	2/1961	Fender	84—313

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