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Siminoff

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[54] **NECK TRUSS STRUCTURE FOR STRINGED MUSICAL INSTRUMENTS**

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[52] **U.S. Cl.** **84/293;** 84/267

[51] **Int. Cl.²** **G10D 3/00**

[58] **Field of Search** 84/267, 290, 293

[56] **References Cited**

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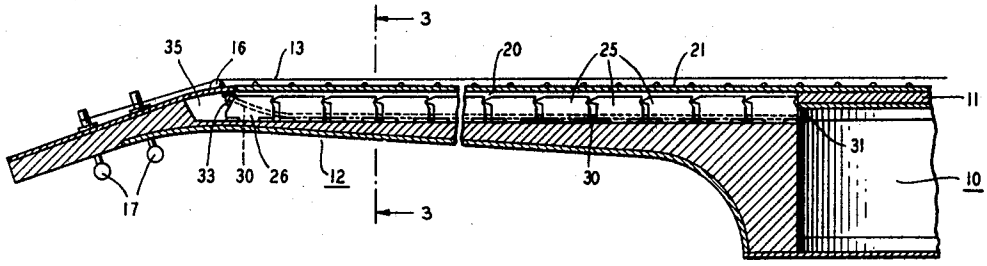
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Assistant Examiner—Vit W. Miska

[57] **ABSTRACT**

A stringed musical instrument in which the neck is prevented from warping by a neck truss structure comprising a plurality of specially shaped links serially positioned on a truss rod extending in a slot through the length of the neck.

9 Claims, 3 Drawing Figures



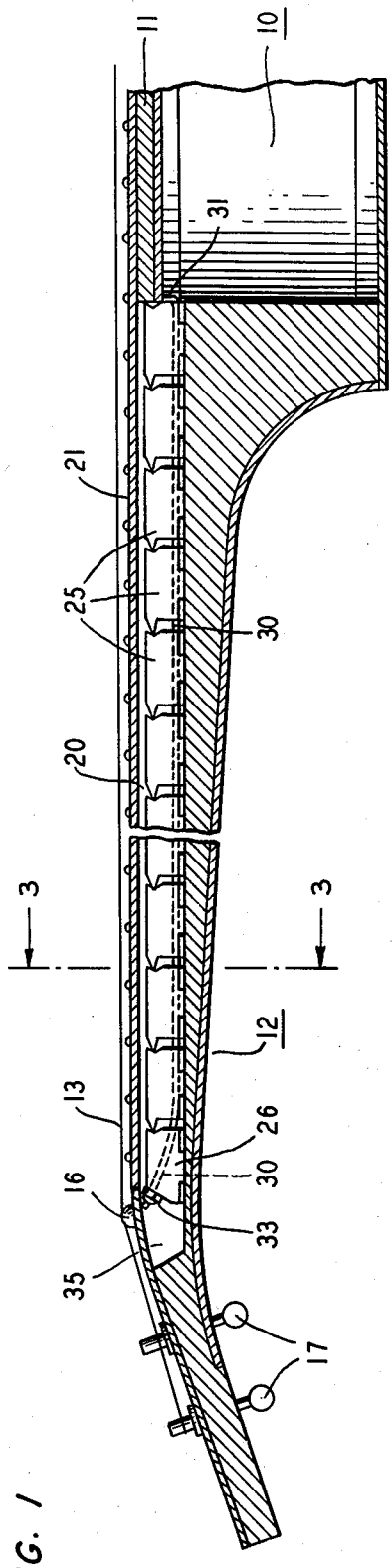


FIG. 1

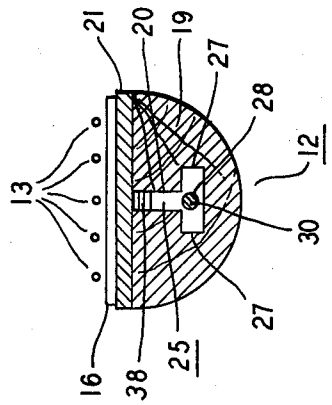


FIG. 3

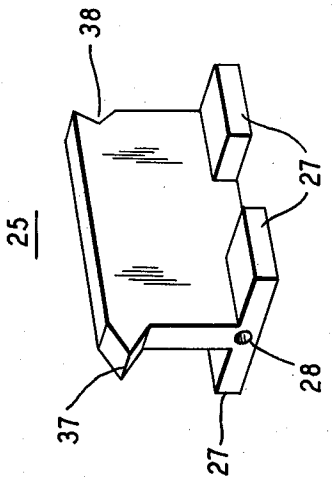


FIG. 2

NECK TRUSS STRUCTURE FOR STRINGED MUSICAL INSTRUMENTS

BACKGROUND OF THE INVENTION

This invention relates to stringed musical instruments such as guitars, banjos, mandolins, etc., and more specifically to a support arrangement for the neck of such instruments.

The necks of such instruments are generally made of wood and, being relatively long and thin, are subject to warping. It has been known since T. J. McHugh patent 1,446,758, Feb. 27, 1923, that this warping can be inhibited by placing a rod or neck truss in a slot through the length of the neck. By means of an adjusting bolt at the end of this rod, the rod can be placed in tension, with a resultant flexing of the rod. Simultaneously, the wood of the instrument neck is placed in compression.

As a result, the instrument necks have been constructed of hard woods, such as Honduras mahogany, curly maple, or rosewood; these woods are more expensive, adding to the cost of the instrument. Further, manufacture of the instrument with this truss rod requires a particular construction, including a time consuming gluing operation, further adding to the overall cost.

It is accordingly an object of my invention to provide an improved neck truss structure wherein the wood or other material of the neck itself is not placed in compression as in prior neck trusses, thereby allowing for the use of hard woods, soft woods, or plastic for the body of the neck itself.

It is a further object of my invention to provide a neck truss structure which simplifies the construction of such musical instruments.

SUMMARY OF THE INVENTION

In accordance with my invention, warping of the neck due to the tension of the strings is prevented, or adjusted for if such warping does occur, by a neck truss arrangement comprising a series of links positioned in a slot extending the length of the instrument neck. These links, which may be of cast aluminum, have side projections extending outwardly at their base, which is positioned in the neck away from the strings. A hole extends through the base of each link, through which holes a steel rod is positioned.

In accordance with an aspect of my invention, the links are shaped adjacent their upper surface so that one side forms a pivot element, such as a knife edge, while the other side has a mating fulcrum recess. Accordingly, the links when positioned on the truss rod adjacent each other define a vertebrae extending the length of the neck of the musical instrument.

Adjacent the pins of the instrument, a recess may be provided in which an adjusting nut is positioned on one end of the truss rod, the other end being locked in place against the last link. Alternatively, the adjusting nut may be positioned within the hollow body of the instrument itself. In either case, the method of adjustment is conventional and similar to adjustments made on prior truss rods of known instruments.

As the adjusting nut is tightened, the vertebrae comprised of the link structure is caused to bow in the direction of the steel rod, causing the neck in which my neck truss structure is installed to bow in sympathy.

Because of the side projections or bosses at the base of each link, the pressure exerted on the neck when the truss rod is tensioned is a primarily bending force rather than the column-effect or compressive force of the prior truss structures. Accordingly, softer and less expensive woods or even plastics can be employed in the construction of the neck while still assuring against warping of the neck due to string tension.

I have found that a neck truss structure in accordance with my invention provides more structural bending power than the prior conventional arrangements. Further, if desired, the lengths of the links can be different to control the bending or shape of the curve at different points on the curve of the truss rod to allow for predetermined bending, thereby controlling the weakest points in the neck.

The number of links and their size will depend on the type of instrument involved and the length of the neck desired.

BRIEF DESCRIPTION OF THE DRAWING

These and other advantageous objects and features of my invention will be further apparent from the following detailed description together with the accompanying drawing, in which:

FIG. 1 is a sectional view of the neck of a stringed musical instrument incorporating a neck truss structure in accordance with my invention;

FIG. 2 is a perspective view of an individual link employed to define the vertebrae of the neck truss structure of the embodiment of FIG. 1; and

FIG. 3 is a cross-sectional view, along the line 3—3, of the neck of the embodiment of FIG. 1, showing particularly the shape of the slot extending the length of the neck of the instrument.

DETAILED DESCRIPTION

Turning now to the drawing, the musical instrument, which may be a banjo, mandolin, bass, or other stringed musical instrument, includes a hollow body portion 10 over which a sounding board 11 is glued, and to which is attached the neck 12. Strings 13 extend over the sounding board 11 and the neck 12, and are bent over a fret 16 to be connected, under tension, to tuning pins 17, as is known. Since my invention is concerned with the neck of the instrument, the other aspects of the instrument may be of any arrangement known in the art and are not otherwise depicted herein.

The neck 12 comprises a rounded base member 19 which may advantageously be of a soft wood, such as soft maple or walnut, rather than the hard woods, such as Honduras mahogany or hard maple, of prior instruments. Extending through the center of the base member 19 is an inverted T-shaped slot 20, best seen in FIG. 3. The slot advantageously extends to the upper surface of the base member 19 and is closed by a wooden fret or finger board 21 secured to the top of the base member 19.

Positioned within the slot 20 are a plurality of links 25, identical except for the initial link 26 adjacent the tuning pins 17. The links may advantageously be of cast aluminum and, as best seen in FIG. 2, have projecting bosses or side projections 27 integrally formed thereon. The projections 27 slip into the bottom portion of the inverted T-slot 20 as best seen in FIG. 3. Also extending through each of the links 25 at the base thereof between the projecting bosses 27 is a hole 28.

In accordance with an aspect of my invention, a truss rod 30, which may be of steel, extends through the

aligned holes **28** of the plurality of links **25.** The inner end **31** of the rod **30** is bent up adjacent the hollow body portion **10** to lock the rod in place. An adjusting nut **33** bears against an inclined surface of the initial link **26** and is positioned within a recess **35** in the neck adjacent the pins **17.**

In accordance with one aspect of my invention, each of the links **25** has a pivot element, which in this embodiment is a knife edge **37,** at one side thereof adjacent the upper surface of the link **25** and a mating fulcrum recess **38** at the other side, so that the pivot edge **37** of one link bears against the recess fulcrum **38** of the directly adjacent edge. Other pivot elements, such as a ball, may also be employed in embodiments of my invention.

As can be seen from FIG. **1** the links **25** are positioned in the slot **20** on the rod **30** so as to define a vertebrae extending through the center of the neck **12.** The adjusting nut **33** is tightened so that the truss rod **30** and vertebrae structure thus defined curve slightly away from the fret board **21** or strings **13,** thereby preventing warping of the neck.

The bending force provided by this truss linkage structure is self-contained and does not rely upon placing the wood of the neck into compression.

Further, I have found that the truss linkage structure may be readily removed if the rod for some reason breaks, whereas the removal of the prior art conventional truss rods is quite difficult.

In one specific illustrative embodiment wherein the musical instrument was a banjo, a total of twelve links **25,26** was employed, each link being of cast aluminum, and the links **25** having the dimensions of ¼ of an inch wide, ⅝ of an inch high, and 1½ inches long, with the bosses **27** projecting 3/16 of an inch from the sides of the links **25.** Truss rod **30** was a 3/16 inch steel rod. The knife edges **37** extended 3/16 of an inch from one side of the links **25** and the recesses **38** were 1/16 of an inch deep, leaving a nominal spacing of ⅛ of an inch between adjacent links.

What I claim is:

1. A stringed musical instrument comprising a neck having a finger board thereon and strings adjacent said finger board and neck truss means within said neck, said neck truss means including a plurality of link elements serially positioned along the length of said neck and within said neck, a truss rod extending through said serially positioned links away from said finger board, and adjusting means on said rod for determining the curvature of said serially positioned links in said neck.

2. A stringed musical instrument in accordance with claim **1** wherein said link elements have a pivot element at one side adjacent said finger board and a mating fulcrum recess at the other side adjacent said finger board.

3. A stringed musical instrument in accordance with claim **2** wherein said pivot element comprises a knife edge.

4. A stringed musical instrument in accordance with claim **2** wherein said adjusting means causes the curvature of said links to be away from said finger board.

5. A stringed musical instrument in accordance with claim **2** wherein said links are positioned in a slot within said neck, said slot having an inverted T-shape, and each of said links having side projections at their base away from said finger board.

6. A stringed musical instrument including a neck having a finger board thereon and strings adjacent said finger board, said neck having an inverted T-shaped slot extending along its length, and neck truss means positioned in said slot to prevent warping of said neck, said neck truss means comprising a vertebrae of adjacent links, each of said links having side projections thereon fitting into the bottom of said T-shaped slot and an aperture between said projections, a truss rod extending the length of said slot and through said apertures of adjacent links, and adjustment means including an adjusting nut at one end of said rod for causing said vertebrae to bend away from said finger board.

7. A stringed musical instrument in accordance with claim **6** wherein said link elements have a pivot element at one side thereof adjacent said finger board and a mating fulcrum recess at the other side adjacent said finger board.

8. A stringed musical instrument in accordance with claim **7** wherein said adjusting means further includes an inclined surface on the first of said links and against which surface said adjusting nut bears, said aperture in said first link being inclined from said side projections to said surface.

9. A stringed musical instrument in accordance with claim **7** wherein said pivot element is a knife edge.

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