July 27, 1965 F. L. DANIEL 3,196,730

MUSICAL INSTRUMENTS

Filed July 17, 1962 2 Sheets-Sheet 1

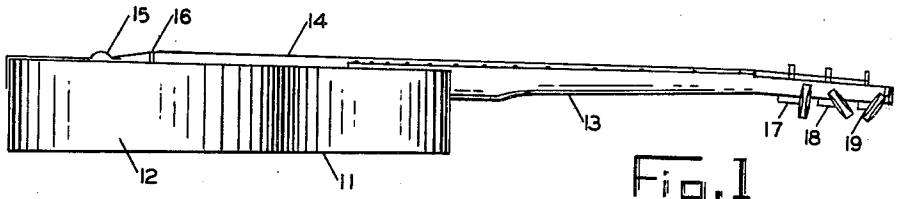


Fig. 1

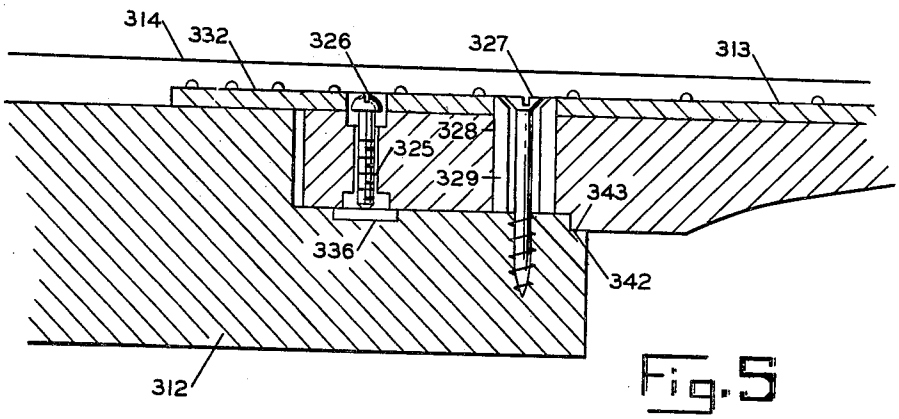


Fig. 5

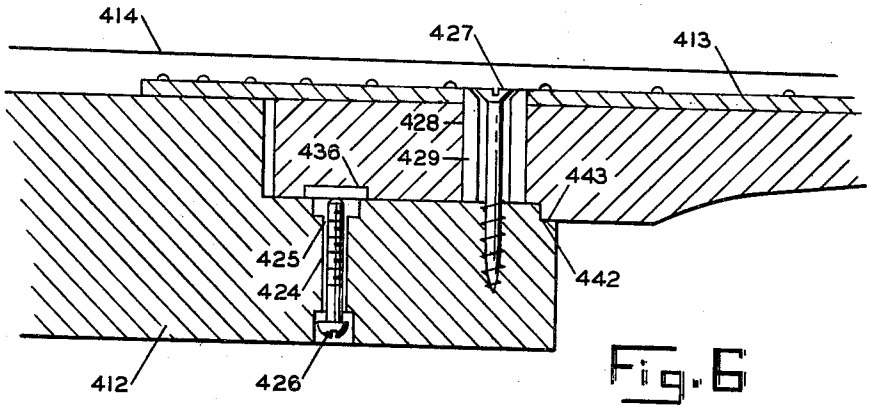


Fig. 6

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MUSICAL INSTRUMENTS

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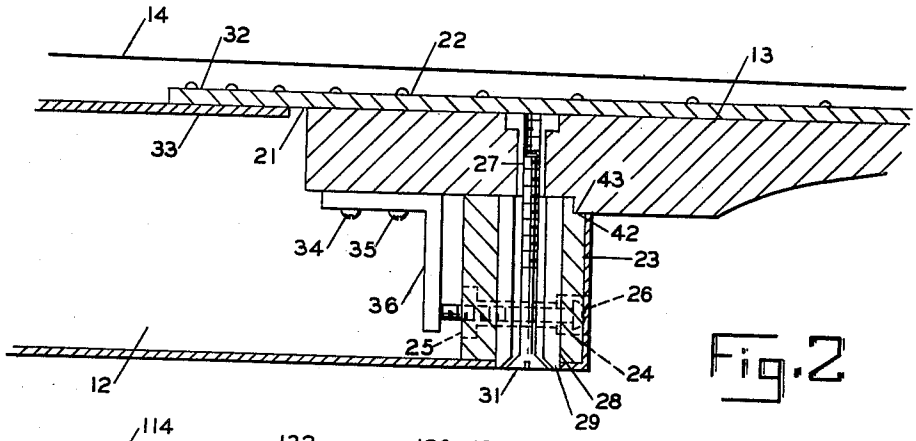


Fig. 2

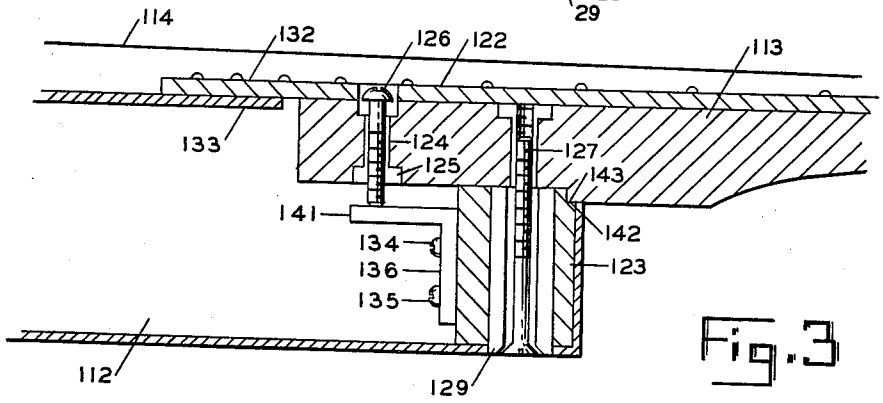


Fig. 3

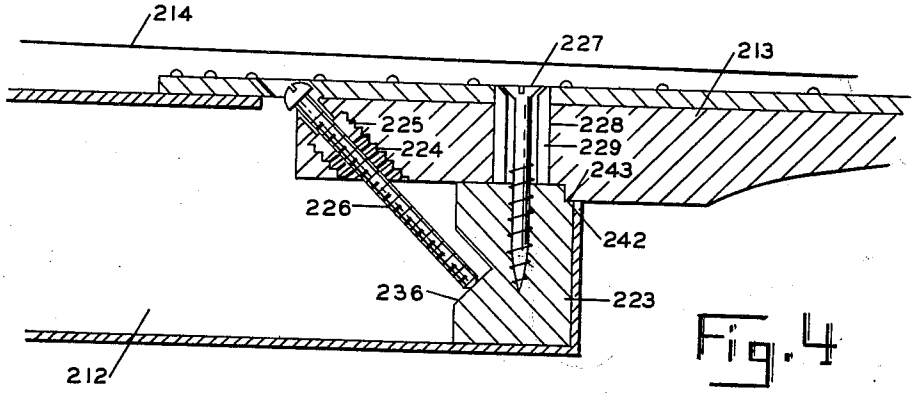


Fig. 4

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3,196,730

MUSICAL INSTRUMENTS

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13 Claims. (Cl. 84—293)

The invention described and claimed in this application relates to musical instruments and more particularly stringed musical instruments.

For many, many years stringed musical instruments have been constructed by skilled artisans or craftsmen painstakingly making the instruments in exactly the same way that their forefathers had. I have discovered a new method of manufacturing stringed musical instruments by which they may be manufactured more expeditiously, more economically, and having features not heretofore available in the previously manufactured musical instruments. For example, while it has been customary to adjust the height of bridges in stringed instruments, in actual practice as distinguished from the patented art, the neck has been usually dovetailed in and rigidly glued to the body so that there has heretofore been no way to adjust the angle of the neck with regard to the body of such an instrument and to compensate for the adjustment of the bridge and to insure that the strings are positioned at a uniform distance from the body and neck.

Some intricate and complicated methods of affixing guitar (or banjo) necks to the instrument bodies with provisions for adjustment have been proposed in the patented art, but these so far as I know have been complicated and impractical from a production standpoint and very uneconomical from a cost standpoint. This is borne out by the fact that guitars manufactured in the United States today are almost all still assembled in the traditional hand-fitted, glued dovetail manner.

My method enables an economical production line manufacture and assembly and enables all desirable adjustments, etc., and actual replacement of the neck by the customer, if such should be necessary. It enables the marketing of a "guitar kit" for easy and professional assembly by the customer. He can attach the neck to the body with a single screw, and accomplish the assembly with professional precision.

In the production of musical instruments embodying my invention, the time and expense involved in connecting the neck to the body by means of dovetailing and gluing are eliminated. In addition to this savings, the angle of the neck is made adjustable in relation to the body. This is a desirable result in that a ready correction may then be made to insure that the strings are positioned at a uniform distance from the body and neck when bridge adjustments or warping occur.

OBJECTS

One of the objects of my invention therefore is the provision of a new method of manufacturing and assembling stringed musical instruments.

A further object of my invention is the provision of a practical, simple and economical method of securing and assembling a new stringed musical instrument.

A further object of my invention is the provision of a new stringed musical instrument having advantages over previously designed stringed instruments.

A further object of my invention is the provision of a musical instrument having the neck joined pivotally to the body so that the neck may be adjusted angularly in a vertical plane about said pivot in order to adjust the relationship of the strings to the instrument and a new method of adjusting the neck relative to the body.

A further object of my invention is the provision of a stringed instrument having the neck separately formed

from the body and having novel means for securing the neck to the body so that the strings form an important function in securing the neck to the body and so that the neck may be pivotally adjusted conveniently relative to the body.

A further object is to make possible economical production line methods of accomplishing the preceding objects.

A further very important object is to allow the neck to extend nearly the full length of the fretted fingerboard thereby assuring the absolutely straight and undeviating fingerboard and fret alignment.

Further objects and features of my invention will be apparent from the following specification and claims when considered in connection with the accompanying drawings illustrating several embodiments of my invention.

In the drawings:

FIG. 1 is a view in side elevation of a musical instrument (specifically a guitar) constructed according to my invention;

FIG. 2 is a view of a fragment of the instrument shown in FIG. 1, shown largely in vertical section and on an enlarged scale;

FIG. 3 is a view similar to FIG. 2 showing a modified form of the adjusting means between the body and the neck;

FIG. 4 is a view similar to FIGS. 2 and 3 showing a further modified form of the adjusting means between the body and the neck;

FIG. 5 is a view similar to FIGS. 2, 3 and 4, showing a still further modification in which the body is solid and in which the neck is secured directly to the body; and

FIG. 6 is a view similar to FIGS. 2–5 inclusive, showing a modification of the construction shown in FIG. 5.

DETAILED DESCRIPTION

Referring now in detail to the drawings for a description of several embodiments of my invention, it may be seen that I have shown in FIG. 1 a guitar 11 having a hollow body 12 and a neck 13 and strings 14 connected to the body as at 15 and passing over a bridge 16 and secured at their opposite ends to turning keys or adjustment screws at the forward end of the neck such as, for example, keys 17, 18 and 19.

FIG. 2 shows a portion of the body 12 having the forward end opened as at 21 for the reception of the rear end of the fretted fingerboard 22 of the neck 13. Positioned in the forward end of the hollow body 12 is a block 23 which is securely fastened to the sides and bottom of the body at the forward end of the body 12 during initial construction of the body in any appropriate manner, as for example, by gluing. The block 23 is formed with a stepped bore 24 in which there is inserted a sleeve 25 which is threaded for the reception of a bolt 26. The sleeve 25 fits tightly in the bore 24 and the bolt 26 is threaded through the sleeve 25 and thus may be moved longitudinally relative to the block 23. The neck 13 is removably and somewhat loosely secured to the block 23 by means of a screw 27 extending substantially vertically through a bore 28 formed in the block and through a sleeve 29, the sleeve being tightly fitted in the bore 28. The screw 27 extends thence upward into the rear end of the neck 13 but does not extend into or through the fretted fingerboard 22. The screw 27, however, fits loosely within the sleeve 29 and therefore some play is allowed between the neck 13 and the block 23. The block 23 is formed with a notch 42 into which a right angled projection 43 formed on the neck 13 fits.

The head 31 of the screw 27 bears upon the bevelled entrance to the bore 28 and holds the rear end of the neck 13 down relative to the block 23. The neck, however, may pivot with the screw 27 relative to the block 23

because of the screw's loose fit in the sleeve 29. The fingerboard 22, as at 32, overlies the forward end 33 of the upper part of the hollow body 12. Secured to the underside of the rear end 22 of the neck 13, as by screws 34 and 35, is an angle iron 36 which has a downwardly extending portion against which the screw 26 bears. The strings 14 connect the forward end of the neck 13 with the rear end of the body 12 and thus tend to cause the neck to pivot in a counterclockwise direction (as seen in FIG. 2) relative to the body 12, the play between the screw 27 and the sleeve 29 allowing this slight amount of pivoting. However, the screw 26 bearing upon the angle iron 36 restrains the neck 13 to limit the amount of this pivot. By adjusting the screw, the amount of pivot is controlled and the position of the strings relative to the body and neck is thereby controlled. Thus any misalignment of the strings because of warping, because of adjustment of the bridge or otherwise, may be compensated.

In FIG. 3 I have designated elements similar to those shown in FIG. 2 by the same numerals with the addition of 100. Thus I have shown a hollow body 112 to which a neck 113 is secured by a screw 127. The fingerboard 122 at 132 overlays an upper portion 133 of the hollow body 112. The angle iron 136 is secured to the block 123 as by screws 134 and 135 and the adjustment screw 126 threaded into the sleeve 125 bears upon the horizontally extending portion 141 of the angle iron 136. The sleeve 125 fits tightly within the stepped bore 124. On the other hand, the screw 127 fits loosely within the sleeve 129. The right angle projection 143 fits into the notch 142.

Similarly, in FIG. 4, I have shown the hollow body 212 carrying a block 223 formed with a notch 236 against which the lower end of the inclined screw 226 bears. The neck 213 is formed with an inclined bore 224. The screw 226 is threaded in the sleeve 225 which is secured within the inclined bore 224. The neck 213 also has a bore 229 in which the sleeve 228 is secured. Extending loosely through the sleeve 228 is the screw 227. The projection 243 fits into the notch 242.

In FIG. 5 the solid body 312 is provided with a plate 336. The rear end of the neck 313 is secured directly to the body 312 by the screw 327. The screw 326 threaded through the sleeve 325 bears on the plate 336 and thus tends to limit the extent to which the strings may rotate the neck 313 in a counter-clockwise direction around the pivot on the screw 327. The extension 332 of the neck overlays the top of the body 312. The forward end of the body 312 is formed with a notch 342 and the neck 313 is formed with a projection 343 which fits into the notch 342.

In FIG. 6, the neck 413 is connected to the body 412 by a screw 427. The neck 413 carries a plate 436 on which the upper end of the screw 426 bears. The screw 426 is threaded through the sleeve 425 snugly fitted in the bore 424. The projection 443 fits into the notch 442.

OPERATION

In the assembly of an instrument such as that shown in FIGS. 1 and 2, the sides and bottom of the body are first fastened to the block 23. The top is secured to the sides. Then the bores 24 and 28 are formed in the block 23 and the sleeves 25 and 29 are assembled therein. The notch 42 is cut in the body.

The rear end of the neck 13 is formed with the projection 43. The fingerboard 22 is secured to the top of the neck 13 and positioned so that the projection or lip 32 extends rearward therefrom. The sleeve 29 is secured in the bore 28. The angle iron 36 is secured to the underside of the neck 13. The assembled neck is secured to the block 23 by the screw 27. The relationship of the neck to the body 12 is adjusted by means of the screw 26 so that the strings 14 bear the proper relationship to the body 12 and the neck 13. If later this relationship is disturbed in any way as by adjustment of the bridge 16 or warping of the body 12 or neck 13, the relationship may be corrected by manipulation of the screw 26.

The embodiments shown in FIGS. 3, 4, 5 and 6 may be similarly assembled and relationships therein may be controlled by manipulations of the screws 126, 226, 326, and 426 respectively.

It is to be understood that the above described embodiments of my invention are for the purpose of illustration only and various changes may be made therein without departing from the spirit and scope of the invention.

I claim:

1. A stringed musical instrument comprising

a body having a front end and a rear end, and having sides, a top, a bottom, and a solid block member to which the sides, top and bottom of the body are secured;

a bridge secured to said body adjacent to the rear end of said body;

an elongated neck member having a front end and a rear end and being adjustably secured adjacent to its rear end to said block member adjacent to the front end of said body;

a plurality of strings secured to the body at a point rearward of but adjacent to the bridge and passing over the bridge and connected to the front end of the neck and tending to urge said rear end of the neck member against said block and the front end upward and out of a straight line continuation of said body;

the block member and the neck member forming cooperating connecting members and at least one of said connecting members being formed with a vertical bore;

means comprising a threaded member passing vertically through the bore in said one connecting member and having a diameter sufficiently smaller than the bore in said one connecting member so that there is appreciable space between the threaded member and the bore and secured to the other connecting member for securing the neck member to the block member and to the body in such a manner that the neck may be moved angularly up and downward relative to a straight line continuation of said body; and

means comprising a second threaded member operatively connected to said neck and said body for adjustably limiting the angular movement of the neck in accordance with the urging of said strings.

2. A musical instrument comprising

a solid body having a front end and a rear end;

a bridge secured to said body adjacent to the rear end of said body;

an elongated neck having a front end and a rear end and formed with a bore adjacent to its rear end and extending vertically downward therethrough and said neck being adjustably secured to said body at a point adjacent to the rear end of the neck;

a plurality of strings secured to the body at a point adjacent to the bridge and passing over the bridge and connected to the front end of the neck and tending to urge said front end of the neck upward and out of a straight line continuation of said body;

means comprising a screw passing vertically downward through said bore in the neck and threaded downwardly into said body for securing the neck to the body in such a manner that the neck may, to a limited extent, be moved angularly upward and downward relative to a straight line continuation of said body; and

means comprising a second screw operatively connected to said neck and said body for adjustably limiting the angular movement of the neck away from a straight line continuation of said body.

3. The structure of claim 1 in which the block has a

front end, in which the front end of said block is formed with a right angled notch, and in which the neck adjacent to its rear end is formed with a right angled projection fitting within said notch and cooperating therewith in the pivoting of said neck relative to the block.

4. The structure of claim 1 in which the second threaded member passes through the rear end of the neck at an angle and bears upon the block.

5. The structure of claim 1 in which said block member is formed with a horizontal bore, in which there is a metallic right angled brace secured to the rear end of said neck member, and in which said second threaded member passes through said horizontal bore in said block member and bears upon said brace.

6. The structure of claim 1 in which the neck member is also formed with a second vertical bore also adjacent to its rear end, in which there is a metallic right angled brace secured to said block member, and in which said second threaded member passes through said second bore in said neck member and bears upon said brace.

7. The structure of claim 1 in which the neck member is also formed with a second vertical bore also adjacent to its rear end, in which there is a metallic plate secured on the upper face of the body adjacent the front end of the body, and in which said second threaded member passes vertically downward through said second bore and bears upon said plate.

8. The structure of claim 1 in which the front end of the body is formed with a vertical bore, in which there is a metallic plate secured to the under side of the neck adjacent to its rear end, and in which said second threaded member passes vertically upward through the said vertical bore in the body and bears on said metallic plate.

9. A stringed musical instrument comprising

a structure according to claim 3 in which said block is of small size relative to the size of said body and is positioned in said body adjacent to the front end of said body and there is a substantially vertical bore formed in said block;

said first threaded member comprises a screw passing vertically through the bore in the block and fastened to the neck; and

said second threaded member is a second screw.

10. The structure of claim 9 in which the bore in the block is provided with a sleeve and in which the opening through the sleeve is appreciably larger than the exterior of the first screw whereby the screw fits loosely in the sleeve.

11. A stringed musical instrument comprising a structure according to claim 1 in which the threaded member is a screw passing substantially vertically through a bore in said neck and into the block at the front end of said body for securing the neck to the body in such a manner that the neck may be moved angularly upward and downward relative to a straight line continuation of said body; and

in which the second threaded member is a second screw operatively connected to said neck and said body for adjustably limiting the movement of the neck as urged by the tension of the strings.

12. A stringed musical instrument comprising

a body having a front end and a rear end, and having sides, a top, a bottom, and comprising a solid block member;

a bridge secured to said body adjacent to the rear end of said body;

an elongated neck member having a front end and a rear end and being adjustably secured adjacent to its rear end to said block member adjacent to the front end of said body;

a plurality of strings secured to the body at a point rearward of but adjacent to the bridge and passing

over the bridge and connected to the front end of the neck and tending to urge said rear end of the neck member against said block and the front end of the neck member upward and out of a straight line continuation of said body;

the block member and the neck member forming cooperating connecting members and at least one of said connecting members being formed with a vertical bore;

means comprising a threaded member passing vertically through the bore in said one connecting member and having a diameter sufficiently smaller than the bore in said one connecting member so that there is appreciable space between the threaded member and the bore and secured to the other connecting member for securing the neck member to the body in such a manner that the neck may be moved angularly up and downward relative to a straight line continuation of said body; and

means comprising a second threaded member operatively connected to said neck and said body for adjustably limiting the angular movement of the neck in accordance with the urging of said strings.

13. A stringed musical instrument comprising

a body having a front end and a rear end having sides, a top, a bottom, and solid block member to which the sides, top, and bottom are secured;

a bridge secured to said body adjacent to the rear end of said body;

an elongated neck member having a front end and a rear end and being adjustably secured adjacent to its rear end to the block member adjacent to the front end of said body;

a plurality of strings secured to the body at a point rearward of but adjacent to the bridge and passing over the bridge and connected to the front end of the neck member and tending to urge the rear end of the neck against said block, and said front end of the neck member upward and out of a straight line continuation of said body;

the block member and the neck member forming cooperating connecting members and at least one of said connecting members being formed with a vertical bore;

means comprising a screw passing vertically through said bore in said one connecting member, and having a diameter sufficiently smaller than the bore in said one connecting member so that there is appreciable space between the screw and the bore and secured to the other connecting member for securing the neck member to the block member and to the body in such a manner that the the neck may be moved angularly upward and downward relative to a straight line continuation of said body; and

means comprising a second screw operatively connected to said neck and said body for adjustably limiting the movement of the neck in accordance with the urging of the strings.

References Cited by the Examiner

UNITED STATES PATENTS

498,113	5/93	Hartmann	84—293
1,818,631	8/31	Larson	84—293
2,335,244	11/43	Gugino	84—293

FOREIGN PATENTS

261,945	7/13	Germany.

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