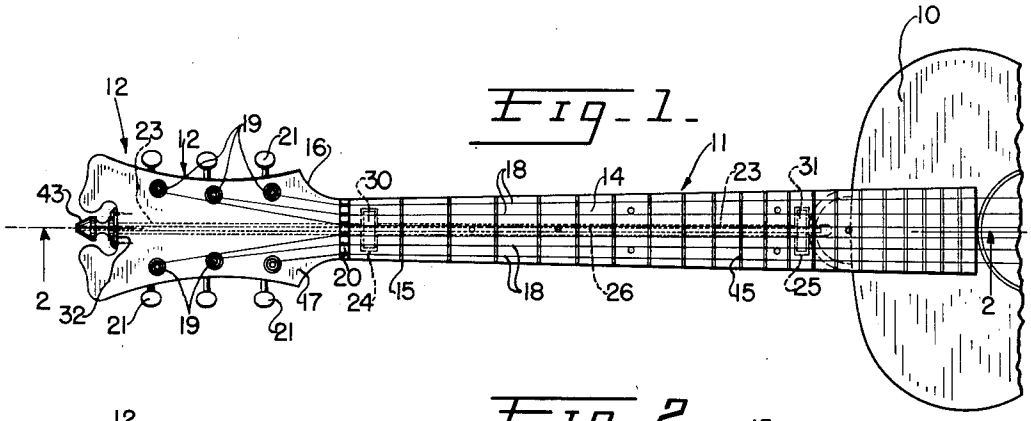
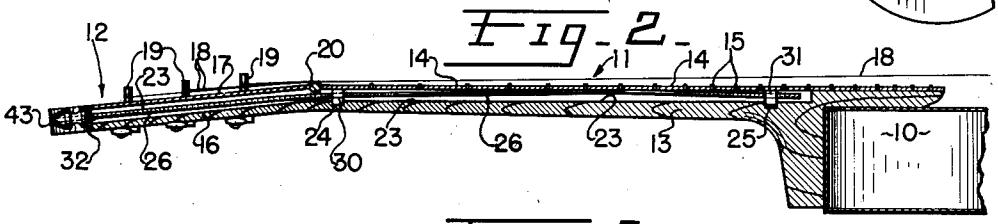
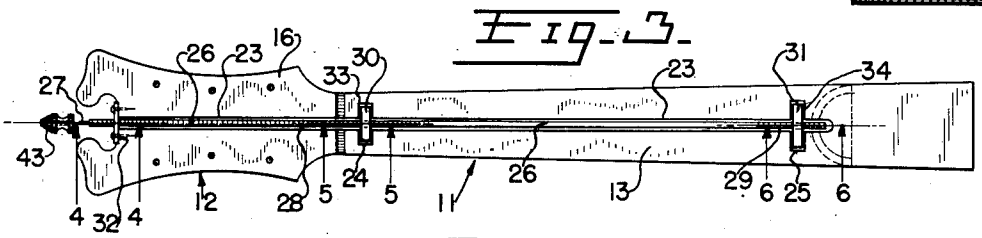
June 6, 1950 F. FORCILLO 2,510,775

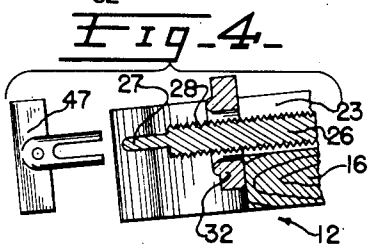
ATTACHMENT FOR FRETTED, STRINGED MUSICAL INSTRUMENTS

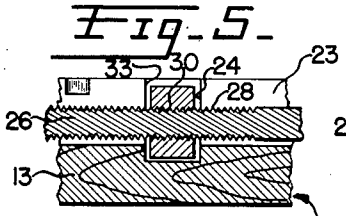
Filed April 29, 1948

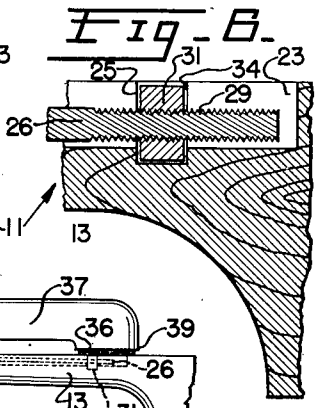


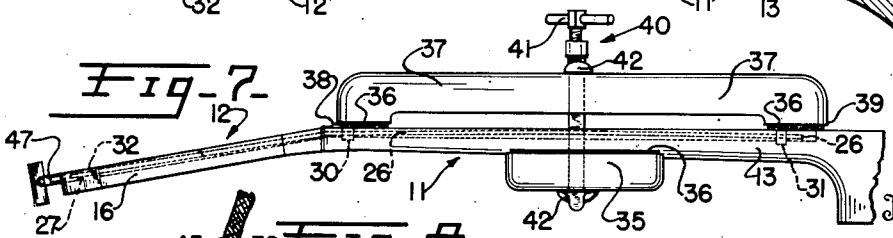


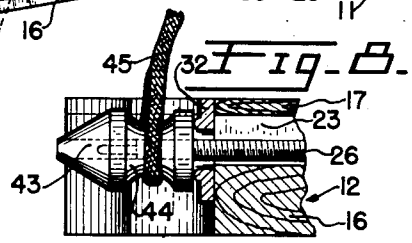












Inventor.

FRANK FORCILLO.

By Barney & O'Connell

Attorneys.

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ATTACHMENT FOR FRETTED, STRINGED MUSICAL INSTRUMENTS

Frank Forcillo, Jersey City, N. J.

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5 Claims. (Cl. 84—293)

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This invention relates to fretted, stringed musical instruments such as guitars, mandolins and banjos, and more particularly to the neck and head constructions of such instruments.

Instruments such as guitars employ a relatively large number of strings made of steel, the strings being maintained at high degrees of tension in order to produce the desired tones. When the strings are tightened by means of tightening knobs on the head, the strings exert a force on the neck of the instrument in such a way as to tend to warp the neck. As a result, the fingerboard on the neck becomes concave to such an extent that it is difficult to depress the strings to the frets on the fingerboard. It is thus impossible to properly play the instrument and it must be discarded. It is therefore a general object of this invention to provide means for counteracting the force on the neck due to the tightened strings.

It is another object to provide a neck construction having adjustable means for maintaining the neck against warping as a result of changing climatic and atmospheric conditions.

It is a further object to provide a neck construction which can be straightened without the necessity of removing the strings on the instrument.

It is a further object to provide a warp-proof neck for a fretted stringed instrument, which neck is simple in structure, inexpensive to manufacture and efficient in use.

In pursuance of these, and other objects which will be apparent to those skilled in the art, I provide an integral neck and head structure having a longitudinal channel extending the entire length of the neck and head. The channel is equipped with a compression rod extending the full length of the channel and in threaded engagement with bearing blocks. The neck is provided with recesses transverse of the channel and receptive to the bearing blocks. The threaded portion of the compression rod engaging one of the bearing blocks carries a clockwise thread, and the threaded portion of the compression rod engaging the other bearing block carries counterclockwise threads. The fingerboard of the instrument is secured to the neck over the channel and compression rod by any suitable means such as glue. I also provide a head plate which is secured over the channel and compression rod in the head of the instrument. One end of the compression rod extends out the end of the head of the instrument and is wrench-faced so that the compression rod may be rotated by means of a key. When the compression rod is rotated by the key, the portion of the rod between the bearing blocks is placed in compression so that the central portion bows upwardly against the fingerboard. A bending force is thereby exerted upon the neck in a direction opposite to that exerted on the neck by the strings of the instrument. By this construction the warping tendency of the strings of the instrument is counteracted. By extending the compression rod out through the end of the head of the instrument and providing it with a wrench-faced end, the compression rod may be adjusted conveniently without the necessity of removing the strings of the instrument. The compression rod may be adjusted until the warping tendency of the strings is precisely counteracted.

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Referring briefly to the drawings wherein I show a presently preferred embodiment of the invention,

Figure 1 is a top plan view of the neck end of a fretted, stringed instrument provided with improved means for preventing the warping of the neck;

Figure 2 is a longitudinal cross section of the same taken on the line 2—2 of Figure 1 looking in the direction of the arrows;

Figure 3 is a top plan view of the neck and head of the same with the fingerboard and head plate removed to show the compression rod and bearing blocks inset therein;

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 3 looking in the direction of the arrows and illustrating the manner in which the compression rod is rotated by means of a wrench key;

Figure 5 is a fragmentary sectional view taken on the line 5—5 of Figure 3 looking in the direction of the arrows and illustrating the manner of insetting the compression rod and bearing block in the neck;

Figure 6 is a fragmentary sectional view taken on the line 6—6 of Figure 3 looking in the direction of the arrows and illustrating the details of the other bearing block inset in the neck and engaged with the end of the compression rod;

Figure 7 is an elevational view of the neck and head of the instrument clamped in a special vice by which the adjustment of the compression rod is facilitated; and

Figure 8 is a fragmentary sectional view of the end of the head of the instrument illustrating the use of a knob engaged with the end of the compression rod to house the wrench face end of the compression rod and to provide a support

for one end of the supporting cord of the instrument.

Referring now in greater detail to the drawings, a fretted, stringed instrument is shown having a sound box 10, neck 11 and head portion 12. The neck 11 consists of a neck body 13, normally constructed of wood, and a fingerboard 14 having a plurality of frets 15 thereon. The body 16 of the head portion 12 is normally an integral part of the neck body 13. I provide a head plate 17 superimposed on the body 16 for reasons that will be apparent. Strings 18 are secured at one end to string pegs 19 from which they pass over a bridge 20 and over the fingerboard 14 to an anchoring point (not shown) on the sound box 10. The strings 18 are stretched tautly over the fingerboard 14 by means of string tightening knobs 21 which are used to rotate the pegs 19 and cause the strings to be wound thereon.

As is apparent from Figure 2, it is customary to dispose the head portion 12 at an angle to the neck 11 in order to force the strings firmly against the bridge 20 and thereby positively fix the location of the end of the vibrating portions of the strings. Because the strings are supported at both ends, at a point above the level of the fingerboard 14, it is obvious that the strings exert a warping force on the neck 11 tending to concave the fingerboard side. This tendency is especially great in fretted instruments of the type employing strings of steel wire. The tension exerted by the six strings is very great when the instrument is properly tuned. In order to counteract this warping tendency of the strings, I provide a neck body 13 and the head body 16 having a longitudinal channel 23 in the upper surfaces thereof and terminating at the end of the head. This construction is shown to advantage in Figure 3 where the fingerboard 14 and head plate 17 have been removed. I also provide recesses 24 and 25 in the neck and disposed laterally across the longitudinal channel 23. A compression rod 26 is provided with a wrench-faced end 27, and a threaded portion 28 at one end, and another threaded portion 29 at the other end. Threads 28 and 29 are oppositely arranged, that is, one of the threads is clockwise and the other is counterclockwise. A bearing block 30 is engaged with the threaded portion 28 of the compression rod, and another bearing block 31 is engaged with the other threaded portion 29. A punched journal plate 32 made of relatively soft metal is secured to the end of the head in juxtaposition with the end of the channel 23. The wrench-faced end 27 of the compression rod 26 is inserted in the punched journal plate 32 and the bearing blocks 30 and 31 are inserted into recesses 24 and 25 respectively in the neck body. It will be noted that the compression rod 26 is made to conform with the angularity of the head relative to the neck, the compression rod being of flexible material and being well adapted to this limited amount of distortion.

After the compression rod 26 and the bearing blocks 30 and 31 have been positioned, the fingerboard 14 is secured in place over the top of the neck body 13 in any suitable manner, preferably by screws and glue. The head plate 17 is also secured over the top of the body 16 of the head portion in like manner. The channel 23, having therein the compression rod 26, is thus transformed into an enclosed bore. When thus completely assembled, a key 47 may be engaged with the wrench-faced portion 27 of the compression rod and employed to rotate said rod. Since the threaded portions 28 and 29 are oppositely arranged, rotation of the compression rod 26 in one direction tends to force the bearing blocks 30 and 31 apart and against the faces 33 and 34 of the recesses 24 and 25 respectively. This places the portion of the rod 26 between the bearing blocks under compression with the result that it has a tendency to bow upwardly. It will be observed that the bowing tendency of the compression rod 26 is always upwardly against the underside of the fingerboard 14 by reason of the fact that one end of the compression rod is distorted downwardly in conformance with the angularity of the head portion 12. By this construction the tightening of the compression rod 26 causes a force to be exerted on the neck 11 in such a direction as to offset the warping tendency of the strings 18. It will be observed that another important advantage flows from the extension of the compression rod 26 through the head portion 12, namely that the wrench-faced end 27 of the rod is conveniently disposed to be acted on by key 47 for rotating the rod 26. By this construction it is possible to adjust the degree of compensating force without the necessity of disturbing the strings of the instrument. The compression rod 26 may be adjusted when the strings are tuned, and the amount of adjustment may be made such that there is a precise compensation for the warping tendency of the strings.

In order to facilitate the tightening of the compression rod 26, I provide a special clamp including a block 35 formed with a longitudinal cavity conforming with the shape of the underside of the neck body 13. The block 35 is faced with a soft mar-preventing material 36 such as felt. An inverted U-shaped block 37 has bearing surfaces 38 and 39 which are likewise covered with felt and adapted to engage the fingerboard 14 of the neck without injury to the fingerboard, the frets or the strings. A conventional vise 40 is used in conjunction with the blocks 35 and 37 as shown to advantage in Figure 7. It is apparent that by tightening the handle 41 of the vice, the jaws 42 are made to act through the blocks 35 and 37 and cause the neck 11 to be bowed upwardly. When the neck is thus distorted, it is very easy to rotate the compression rod 26 by turning the key 47. It is to be understood that the clamp means thus described may be employed, or not, as desired, since it is possible to adjust the compression rod 26 without the use thereof. When the clamp means have been employed and the compression rod 26 has been tightened, the clamp means are removed from the neck 11 of the instrument and further adjustment of the compression rod may be made as appears necessary in order to compensate for the warping tendency of the strings and the climatic conditions.

As shown to advantage in Figures 1 and 8, I utilize the threaded wrench-faced portion 27 of the compression rod 26 to support a knob 43. The knob 43 is screwed in place after the compression rod 26 has been adjusted to the desired degree of compression. It is to be understood that the knob 43 is not needed to prevent the compression rod 26 from rotating since the bearing blocks 30 and 31 perform this function automatically. Knob 43 has a narrowed portion 44 which is receptive to the loop of a supporting cord 45 which may be passed around the neck of the player of the instrument and fastened at its other end to a point on the sound box 10 of the

instrument. Knob **43** thus has a utilitarian purpose and it also serves to enhance the pleasing appearance of the instrument by concealing the wrench-faced end **27** of the compression rod **26**.

It is apparent that I have provided a neck and head construction for a fretted, stringed instrument, which construction is characterized by having means for readily compensating for the warping effect of the strings and weather conditions. The adjustment of the neck may be conveniently made at any time without disturbing the strings of the instrument. By my construction it is possible to considerably decrease the size of the neck of the instrument without sacrificing rigidity. In this way the instrument may be made lighter and easier to handle. It is also apparent that my device for preventing the warping of the neck is not visible from the exterior of the instrument and in no way detracts from the conventional appearance of the instrument. An ornamental and utilitarian knob is also provided.

While the invention has been described in detail in its present preferred embodiment, it will, of course, be understood that such has been done for purposes of illustration only and not by way of limitation, and therefore only such limitations are to be imposed thereon as may reasonably come within the scope of the appended claims.

What I claim is:

1. In a stringed musical instrument, a neck and a head portion disposed at an angle therewith, the neck and head portion being provided with a longitudinal bore opening at the end of the head portion, a rod in the bore having a wrench-faced end extending from the end of the head portion and having threaded portions in engagement with the neck near the ends thereof, the threads being oppositely arranged so that rotation of the wrench-faced end of the rod in one direction puts that part of the rod between the threaded portions under compression.

2. In a stringed musical instrument, a unitary neck body and head body provided with a continuous longitudinal channel on the upper surfaces thereof, recesses in the upper surface of the neck near the ends thereof, threaded bearing blocks in the recesses, a rod in the channel having a wrench-faced end extending from the end of the head body, and having threaded portions engaged with the bearing blocks, the threads being oppositely arranged, a fingerboard secured to the top of the neck body enclosing the channel therein, and a head plate secured to the top of the head body enclosing the channel therein.

3. In a stringed musical instrument, a neck and angularly disposed head, a longitudinal bore therein opening at the end of the head, bearing blocks in the neck near the ends thereof, at least one of the blocks being provided with a threaded opening, and a rod in the bore having a wrench-faced end extending from the end of the head and having portions engaged with the blocks, the rod being operative to bow upwardly between the bearing blocks when rotated in one direction.

4. In a stringed musical instrument, a neck and head portion having a longitudinal bore opening at the end of the head portion, bearing blocks inset in the neck near the ends thereof, and a compression rod in the bore having a wrench-faced end extending from the end of the head portion, and having threaded portions in engagement with the bearing blocks, the threads being oppositely arranged so that rotation of the compression rod in one direction puts the portion of the rod between the bearing blocks under compression, whereby the warping effect of the strings of the instrument is counteracted.

5. For use with a stringed musical instrument having a neck and angularly disposed head, a longitudinal bore therein opening at the end of the head, bearing blocks in the neck near the ends thereof, at least one of the blocks being provided with a threaded opening, a rod in the bore having a wrench-faced end extending from the end of the head and having portions engaged with the blocks, the rod being operative to bow upwardly between the bearing blocks when rotated in one direction, a clamp comprising blocks and a vise, one of the blocks having longitudinal cavity conforming to the shape of the underside of the neck body, another of the blocks being U-shaped, free ends of which are adapted to engage the fingerboard side of the neck, the vise being engageable with said blocks for bowing the neck to permit easy adjustment of the compression rod.

FRANK FORCILLO.

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