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TIGHTENING DEVICE

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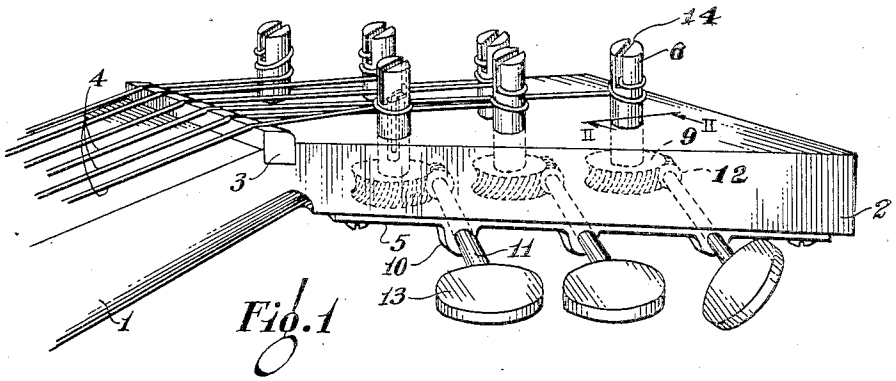


Fig. 1

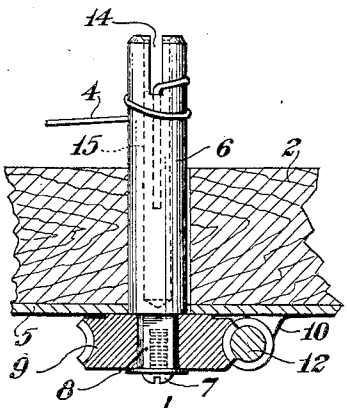


Fig. 2

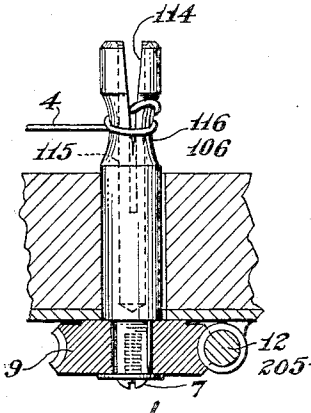


Fig. 3

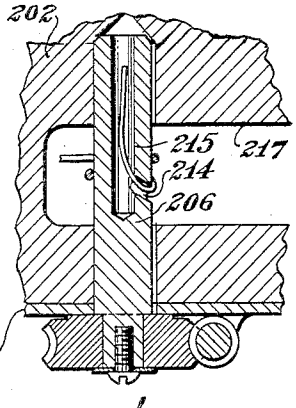


Fig. 4

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TIGHTENING DEVICE

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4 Claims. (Cl. 84—304)

This invention relates to tightening devices and is particularly applicable to tightening devices used for creating and maintaining tension upon strings such as are used in musical instruments.

An object of the invention is to provide an improved tensioning device.

Another object is to provide an improved tensioning device which will receive the ends of a string of a musical instrument.

Another object is to provide an improved tensioning device which will firmly hold strings subjected to relatively high tension.

Another object is to provide an improved tensioning device which will be simple in construction.

Another object is to provide an improved tensioning device which will be easy of operation.

Other objects will hereinafter appear.

The invention will be better understood from the description of several practical embodiments thereof illustrated in the accompanying drawing; in which;

Figure 1 is a fragmentary perspective view of the outer end of the neck and head of a musical instrument, such as a guitar;

Figure 2 is a sectional view taken on the line II—II of Figure 1;

Figure 3 is a view similar to Figure 2 of a modified form of tightening device; and

Figure 4 is a view also similar to Figure 2 of a further modification thereof.

The present tendency in string musical instruments is away from strings of the type made of gut or other animal or vegetable fibre and toward metal strings such as are used in the piano and which generally are made of steel, with or without wrapping, depending upon the pitch of the tone desired.

The use of metal strings introduces two problems which were not present with gut or similar strings; one, the strings, due to their greater weight, must be strained to a much higher tension for a given note; and two, the ends of the wires, being stiff but of small diameter, are sharp and produce painful cuts and scratches and the like when one grips the head of an instrument, as is done in adjusting or changing the strings. The higher tension requires that the strings be much more firmly held than was previously necessary, as very slight amounts of slippage cause them to become seriously out of tune.

In Figure 1 is shown a part of the end of the neck of a string instrument, for this illustration a guitar having been chosen, the neck itself appearing at 1, and the extension thereof or head being shown at 2. At the juncture of the head and neck is a bridge 3 which is notched for the reception of the usual strings 4.

The strings are secured in tightening devices shown as arranged in two groups, one accessible from each side of the head, each group being united by a common base plate 5. Passing through this base plate and through holes in the wooden head are pins 6, and secured to the lower end of each pin as by a screw 7 threaded in the squared end 8 of the pin is a worm wheel 9.

Journalled in depending lugs 10, formed upon the base 5, are shafts 11, each provided on its inner end with a worm 12 meshing with the worm wheel 9, and on its outer end with a flattened handle or a turning key 13. The worm is of sufficiently low pitch as to be self locking or non-reversible and so prevents any accidental unwinding of the string. The upper end of the pin 6 which extends above the wood of the head 2 is slotted, as indicated at 14, and each pin is provided with an axial bore 15.

The operation of the device is as follows: The operator inserts the end of the wire string into the bore 15, as most clearly shown in Figure 2, and allows the string to extend sidewise through the slot. He then rotates the handle 13, so turning the pin 6 upon its axis, which winds the string about the pin, the string becoming abruptly bent where it leaves the slot 14 and so securely anchored.

The greater the tension which he applies to the string, the tighter it binds against the corner of the slot, and it will be obvious that no ends of the strings protrude to stick the fingers.

In Figure 3 is shown a modification of the pin of Figures 1 and 2 in which the external surface of the pin is made concave or grooved as indicated at 116. The slot 114, instead of having parallel sides, is V-shaped so that the string wedges itself downwardly tightly into the slot. The groove 116 terminates at a point just above that at which the width of the slot 114 is approximately as great as the diameter of the string intended to be inserted in it.

It will be apparent, therefore, that the first turn of the string, falling upon the tapering walls of the groove, tends to move the string downwardly toward the smallest diameter of the pin, and thus causes the successive turns of the string to come below the slot, so that it is unnecessary to position it in this manner by hand.

Also, the tension upon the string causes it to wedge tightly within the V-shaped slot more firmly securing it in place than would be the case of a slot with parallel sides.

If the slot 114 be appreciably deeper than the point where its width equals the diameter of the string, the tension of the succeeding turns of the string will tend to spring the furcations of the end of the pin together, increasing the clamping action upon the string in proportion to the tension applied to it, and similarly increasing the effectiveness with which it is clamped.

In Figure 4 is a device is illustrated which is intended to be applied to the head of an instrument having slots in which the strings are inserted and in which the pins are positioned. The base 205 is, in this case, secured to the sides of the head instead of its bottom and the pin 206 extends from one side across slot 217, having its inner end received within a recess in the head 202 and supported by the wall of this recess. The worm, worm wheel and handle are similar to those previously described.

The pin is provided with an axial bore 215 with which communicates a hole 214 drilled through the side of the pin and which may be positioned radially thereof or inclined as illustrated in the drawing.

For this type of winding apparatus the end of the wire in inserted through hole 214 into bore 215 and the pin rotated by the handle, as above described. The string is then wound upon the pin and held by the sharp bend which its tension creates at the outer end of hole 214.

While we have described several illustrated embodiments of our invention in some particularity, obviously many others will readily occur to those skilled in this art, and we do not, therefore, limit ourselves to the precise details shown and described but claim as our invention all embodiments, variations and modifications thereof coming within the scope of the appended claims.

We claim:

1. A tensioning device comprising a pin rotatable about its axis and having an axial bore for the reception of the end of a string, means enclosing the end of said bore and an opening through the wall of the pin to said axial bore.

2. A tensioning device comprising a hollow cylindrical pin having a diametrically extending slot at one end.

3. A tensioning device comprising a hollow cylindrical pin having a diametrically extending slot at one end, said slot tapering from the end of said pin.

4. A tensioning device comprising a rotatable pin having a bifurcated end, there being a generally longitudinally extending bore within the pin extending from the bifurcated end to adjacent the other end.

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