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STRING TENSIONING DEVICE FOR MUSICAL INSTRUMENTS

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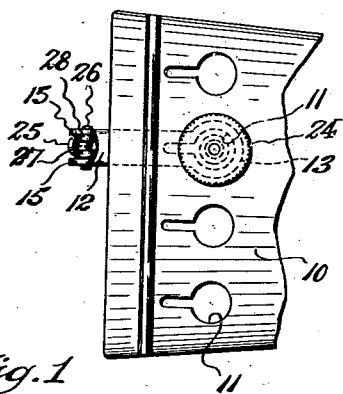


Fig. 1

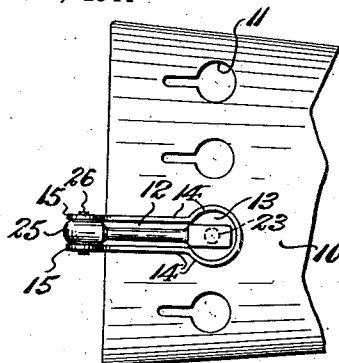


Fig. 2

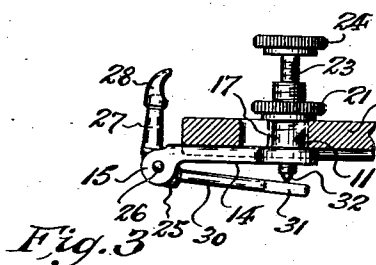


Fig. 3

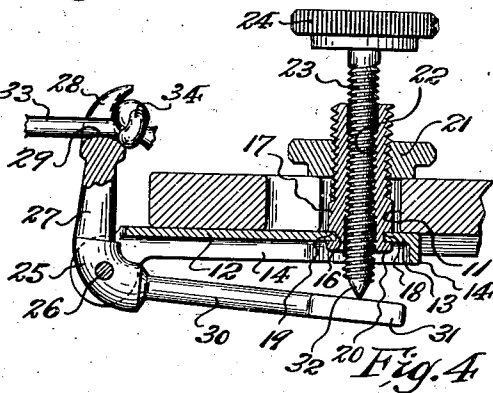


Fig. 4

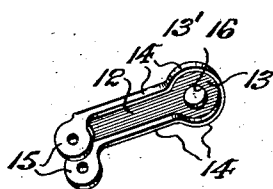


Fig. 6

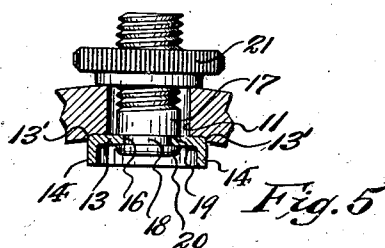


Fig. 5

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UNITED STATES PATENT OFFICE

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STRING TENSIONING DEVICE FOR
MUSICAL INSTRUMENTS

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1 Claim. (Cl. 84—297)

This invention relates to improved means for adjusting the tension of strings on stringed musical instruments, and especially for tensioning the comparatively heavy strings of the larger types of stringed instruments, such as cellos, bass viols and the like; and the invention has reference, more particularly, to an improved tensioning device for application to the tail-piece of a stringed instrument to which the anchored end of a string may be attached, whereby, upon manipulation of the device a very accurate final tuning of the string may be attained.

The invention has for an object to provide a novel construction of tensioning device of the pivoted bell-crank lever type provided with means for swinging the same about its fulcrum, including a strongly reenforced fulcruming base bracket, which is capable of withstanding the force of the stressed string without risk of deformation, and so as to be free from tendency to vibrate and produce undesired buzzing or humming detrimental to the tone of the instrument; said base portion being further provided with means adapted to firmly imbed it in attached relation to the instrument tail-piece.

Another object of the invention is to provide a novel construction of bell-crank lever, which, by reason of its form and structure, is strongly resistant to distortion under the stress and strain transmitted thereto by the tensioned string served thereby; said bell-crank lever having an improved construction of string engageable fork from which all sharp angles of corners have been eliminated, so that wear and tear on the attached string is reduced to a minimum.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this invention is shown in the accompanying drawing, in which:

Fig. 1 is a fragmentary top plan view of the tail-piece of a stringed instrument, such e. g. as a cello or bass viol, showing a novel string tensioning device according to this invention operatively mounted thereon; and Fig. 2 is a bottom plan view of the same.

Fig. 3 is a side elevation of the string tensioning device as operatively attached to an instrument tail-piece, the latter being shown in section.

Fig. 4 is an enlarged vertical sectional view through the tail-piece attached string tensioning device, parts thereof being shown in elevation; Fig. 5 is a fragmentary detail transverse sectional view through the base bracket as coupled to the

instrument tail-piece, with parts in elevation; and Fig. 6 is a perspective view, on a reduced scale, of the base bracket element per se.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawing, the reference character 10 indicates the tail-piece of a stringed instrument, the same being provided with the usual key-hole slots 11 ordinarily employed to receive anchoring attachment thereto of the instrument strings.

The novel string anchoring and tensioning device according to this invention includes a base bracket element formed by a sheet metal stamping comprising an elongated main body 12, having a circular foot piece 13 at its rear end, the diameter of the latter being greater than the width of the main body, and also exceeding that of the circular part of the tail-piece slot 11 with which it is to be associated. Said main body 12 and foot piece 13 are provided, in extension along the sides of the former and around the periphery of the latter, with a depending reinforcing or stiffening flange 14 perpendicular to the planes thereof. Formed integrally with the forward ends of said flanges 14 and in the planes thereof are perforate fulcrum ears 15, disposed to be forwardly and downwardly offset relative to the forward extremity of the main body 12. Said foot piece 13 is provided with a central opening 16.

Upstanding from the circular foot piece 13 of the main body 12 of the base bracket element is an externally screw threaded post 17. Said post 17 is provided at its lower end with an anchoring portion 18 of reduced diameter, which is adapted to be inserted downwardly through said opening 16 of the foot piece 13 until stopped by the abutment of its shoulder 19 against said foot piece. The free end of said anchoring portion is expanded and thus riveted over, as at 20, against the underside of the foot piece, thus rigidly securing the post 17 in upstanding relation to the latter, and so to the base bracket element.

In applying the bracket plate to the tail-piece 10, the post 17 is inserted upwardly through a key-hole slot 11 of said tail-piece, so that the base bracket element abuts the underside of the latter, whereby to extend longitudinally and forwardly therealong. Said base bracket element is of such length that its forward end portion and the fulcrum ears 15 projecting therefrom extend freely beyond the forward extremity of said tail-piece. To secure the base bracket element in such operative assembled relation to the tail-piece 10, a

fastening nut 21 is screwed onto the upper end portion of the post 17, and turned home against the upper side of the tail-piece. When thus screwed home, said fastening nut draws the laterally disposed arcuate sides 13' of the foot piece against the concave underside of the tail-piece, whereby to somewhat imbed such arcuate side margins 13' in the material of the tail-piece, thus strongly and rigidly uniting the base bracket element and tail-piece against relative displacement and vibration.

Said post 17 is provided with an internally screw threaded bore 22 to extend axially there-through, and threaded through said bore is an adjusting screw 23, to the upper end of which is affixed a head 24 by which the same may be manipulated.

The bell-crank lever of the device comprises an elbow 25 of maximum diameter, sized to fit snugly between the fulcrum ears 15 of the base bracket element, being pivotally connected with said ears by a transverse pivot pin 26 arranged to extend through said ears and elbow portion. Integral with and projecting upwardly from said elbow portion 25 is a substantially vertical upper arm 27, the same being of a shape tapering toward its free end portion. The free end portion of said upper bell-crank arm 27 is formed to provide a bifurcate string engageable member or fork 28. Said fork is of substantially concavo-convex shape in transverse vertical plane, with the concave side thereof rearwardly directed; and said fork is provided intermediate its sides with a convexly rounded string bearing seat 29. The rearward edges of said fork sides are rounded so as to present no sharp edges in contact with the instrument string anchored thereto. Integral with and extending rearwardly from the elbow portion 25, and substantially at right angles to the upper arm 27, is a lower arm 30. This lower arm 30 extends below the base bracket element, and is of such length that its free end portion 31 is opposed to the conical extremity 32 of the adjusting screw 23.

The instrument string 33 is suitably engaged or anchored to the upper arm 27 of the bell-crank lever by passing the same through the fork 28 thereof. Said string 33 is provided with a knot 34, or other suitably formed enlargement, which is abutted against the concave seating face formed by the rear side of the arms of the fork 28, and said string 33 extends through the fork 28 so as to be engaged by the convexly rounded bearing seat 29 with which the bottom of the fork interior is provided (see Fig. 4).

It will be noticed that the elbow portion 25 of the bell-crank lever is substantially larger in cross-section than are the arms 27 and 30, and consequently all tendency of the bell-crank to spring or yield to stresses or strains applied by a tensioned string attached thereto will be strongly resisted, while at the same time, due to the sturdy make-up of the bell-crank lever as whole, tendency of its upper arm to vibrate under string stress will also be strongly resisted.

In the use of the device, a string being anchored to the fork of the upper arm 27 of the bell-crank lever; the string may be tensioned by turning down the adjusting screw 23 through the fixed post 17 so as to cause the adjusting screw extremity 32 to engage and thrust downwardly upon the lower arm 30 of the bell-crank lever, thereby rocking said bell-crank lever on its pivot pin 26 so as to swing rearwardly said upper arm 27, thereby stressing the string longitudinally to a desired nicely adjusted and precise degree of tension, so as to obtain extremely accurate tuning of the string. Abrasion of the tensioned string is avoided when the bell-crank lever arm is swung relative thereto, since the string is fulcrumed on the convexly rounded bearing seat 29 with which the bottom of the fork slot is provided.

The flange reenforced base bracket element is very stiff and rigid, much more so than would be a solid base bar or bracket of uniform thickness throughout, and consequently all tendency of the base bracket element to vibrate under transmitted stress or strain of a tensioned string is dampened; thus eliminating undesirable buzzing or humming which, if permitted, would be detrimental to the true tonal quality of the tensioned and timed string.

Having now described my invention, I claim:

A string tensioning device for musical instruments comprising a sheet metal base bracket element having an elongated body of uniform width terminating in a circular foot piece at its rear end having a diameter greater than the width of said body, said bracket element having dependent flanges substantially perpendicular to the plane thereof extending along the sides of said body and around its foot piece, said flanges terminating at the forward end of said body in forwardly and downwardly offset perforate fulcrum ears, an externally screw-threaded upstanding post riveted to the body foot piece to extend through an instrument tail-piece and a nut on said post to draw said body against the underside of said tail-piece and to somewhat imbed lateral portions of the foot piece in the tail-piece material, a string supporting bell-crank lever having an elbow portion of major dimensions, a pivot pin supported by and between said fulcrum ears to extend through said elbow portion intermediate its ends, an upstanding tapered upper arm extending from one end of said elbow portion, said arm terminating in a string anchoring fork having a concave rear face conformation for seating an anchoring enlargement with which the supported string is provided, said fork having a convex string seating portion intermediate its arms, a substantially horizontal lower arm extending rearwardly from the opposite end of said elbow portion, and an adjusting screw extending axially through said post to engage said lower arm for rockingly adjusting said bell-crank lever to tension a string anchored thereby.

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