TREMOLO DEVICE FOR STRINGED INSTRUMENTS

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My invention relates to tremolo devices for stringed instruments, and included in the objects of my invention are:

First, to provide a tremolo device which is particularly adapted for use on guitars and similar stringed instruments played in such manner that one hand is in the region of the bridge, there being a tremolo control arm so arranged as to fit within the palm of the player's hand.

Second, to provide a tremolo device which is incorporated in a novel bridge structure so arranged as to have limited pivotal movement, in order that the tension applied to the strings of the instrument may be readily varied to produce a tremolo effect.

Third, to provide in a tremolo device a novel sectional bridge so arranged that the effective operating length of each string and its height may be individually adjusted to facilitate proper tuning of each string without interfering with simultaneous tension variation of the several strings required to produce a tremolo effect.

With the above and other objects in view, as may appear hereinafter, reference is directed to the accompanying drawings, in which:

Figure 1 is a fragmentary top view of a guitar incorporating my invention;

Fig. 2 is a fragmentary sectional view through 2—2 of Fig. 1;

Fig. 3 is a fragmentary bottom view, taken from the plane 3—3 of Fig. 2 with the cover plate removed;

Fig. 4 is an enlarged fragmentary sectional view through 4—4 of Fig. 1; and

Fig. 5 is a perspective view of one of the bridge elements.

My invention is shown as incorporated in a guitar. The guitar includes a body 1 which is preferably solid and from which extends a neck 2, terminating in a head, not shown. Strings 3 extend from a bridge, to be described hereinafter, over the body 1 and neck 2.

Set within the body 1 is one or more pickup units. In the construction shown, three such pickup units 4, 5, and 6 are indicated. Each pickup unit includes permanent magnet elements located beneath the strings 3. The pickup units are controlled by control knobs 7, 8, and 9 mounted on the body 1. A switch 10 is also provided. Set into the body is a jack outlet 11 for connecting the pickup units and controls to a suitable amplifier. The construction so far described, for the purposes of the present invention, may be considered as conventional.

Formed in the body 1 is a transverse slot 12 which communicates at the under side of the body with a recess 13 directed toward the neck 2. Mounted on the body 1 adjacent the slot 12 is a base plate 14, one margin of which is beveled to form a fulcrum ridge 15. The beveled margin of the base plate 14 is secured to the body 1 by screws 16 which permit limited pivotal movement of the base plate about the fulcrum 15. The fulcrum is located forwardly of the slot 12, that is, toward the neck 2.

The base plate 14 overlies and covers the slot 12 and is provided at its rear margin with an upturned flange 17.

Tension screws 18, one for each string 3, extend forwardly through the flange 17 and are screw threaded into sectional bridge elements 19. Springs 20 are interposed between the bridge elements 19 and the flange 17.

Each bridge element 19 is formed of a strip of sheet metal bent at its rearward extremity to form a horizontally folded end 21 which receives the corresponding tension screw 18. The forward portion of each bridge element is folded upwardly and doubled upon itself to form a bridge portion of U-shaped cross-section 22 spaced outwardly of but relatively closely adjacent each string 3. At each lateral margin each bridge portion is screw threaded to receive a height adjustment screw 23 which bears against the base plate 14. Each bridge element is provided with a slot 24.

Secured to the inner side of the base plate 14 is a bar 25 which extends into the slot 12. The bar is provided with a plurality of vertically extending bores 26, one for each string 3. Each string 3 passes over a corresponding bridge element 19, through slot 24, and into the corresponding bore 26 through a registering hole in the base plate 14. The extremity of each spring is provided with an anchor element 27 which sets in a conical enlarged portion, or counterbore formed at the lower extremity of the corresponding bore 26.

Secured to the lower extremity of the bar 25 is a plurality of tension springs 28. These springs extend forwardly within the recess 13 and are relatively stiff. The forward extremities of the tension springs are retained by hooks 29 formed along a margin of a tension plate 30. The tension plate has a flange 31 at its forward margin which receives screws 32 adapted to be driven into the body 1 at the forward extremity of the recess 13. A cover plate 33 closes the recess 13.

One lateral margin of the base plate 14 and bar 25, preferably the margin which constitutes the lower side of the instrument when in playing position, is extended and receives a control arm 34. The control arm includes a vertical portion 35 which journals in the bar 25 and a laterally directed portion 36, preferably bent intermediate its ends, and terminating in a handle 37. In normal playing position, the handle 37 is disposed above and slightly below the strings 3 so as to be received in the palm of the player's right hand when in position to pluck the strings.

Operation of my tremolo device is as follows:

If the handle 37 is not engaged or is held against movement, the instrument is played in the conventional manner and no tremolo effect is observable. If, however, the handle 37 is oscillated to and from the body 1 during vibration of any or all of the strings 3, a tremolo effect will be produced by each of the vibrated strings.

It should be observed that by reason of the pivotal connection between the control arm 34 and the bar 25 about an axis substantially perpendicular to the upper surface of the body 1, the handle 37 may ride in the palm of the player's hand and be pivoted as the player changes the position of his hand while plucking the strings. Thus, the handle remains in position for use at all times, but no tremolo effect need be produced except when the player desires to do so and oscillates the handle 37 in a direction perpendicular to the surface of the body.

Also by reason of the pivotal connection between the control arm 34 and the bar 25 the handle 37 may be located to suit the individual preference of the player and may be quickly swung out of playing position substantially below the strings as viewed in Fig. 1, or as quickly returned to playing position.

It will be observed that each of the bridge elements 19 are individually adjustable lengthwise of the strings 3 so that the effective vibrating length of each string may be accurately adjusted. Furthermore, by reason of the
An arm extending from said bridge structure and means for contacting said arm with said strings includes a body extending therefrom, a handle adjacent to said body and a plurality of bridge elements mounted on said body. The handle is fixed to the body and has a plurality of bridge elements mounted on it. The bridge elements are used to maintain tension on the strings and prevent them from slipping. The body and handle are designed to fit comfortably in the hands of the musician.

The bridge structure is designed to be adjustable. This is achieved through the use of screws that allow the bridge elements to be moved along the bridge. The bridge elements are adjustable to accommodate different tensions and widths of the strings. This allows the musician to fine-tune the sound of the instrument to their liking.

The bridge structure also includes a design for stringing the instrument. The strings are strung through the bridge structure, and the tension is maintained by the bridge elements. The bridge structure is designed to be durable and able to withstand the stresses of playing the instrument.

Overall, the bridge structure is an essential component of the instrument, providing the necessary support and tension for the strings to produce the desired sound. It is a complex and intricate piece of the instrument, and its design and structure play a crucial role in the function and performance of the instrument.
said bridge structure but with movement of said arm toward and away from said face oscillating said bridge structure.

10. The combination with a musical instrument having a body and strings extending thereover, of a tremolo device, comprising: a bridge structure secured to said body for limited pivotal movement to vary the tension on said strings; means carried by said bridge structure receiving and anchoring the ends of said strings; springs extending between said bridge structure and said body acting to maintain tension on said strings, said bridge structure and springs having a relatively large mass whereby said bridge structure tends to be uninfluenced by vibration of said strings; and an arm secured to and extending from said bridge structure and manually engageable to oscillate said bridge structure.

11. The combination with a musical instrument having a body provided with a face with strings extending thereover, of a tremolo device, comprising: a plate mounted closely adjacent the plane of the face of said instrument for pivotal movement on a fixed axis substantially parallel with said face and extending transversely of said strings, said pivotal movement varying the tension on said strings; means secured to said plate anchoring the ends of said strings; a bridge member secured to said plate and having raised portions engaging said strings and spacing said strings outwardly from said face, said raised portions being located closely adjacent but outwardly of said axis; yieldable means connected between said plate and said body normally maintaining said strings under tension; and handle means connected with said plate for manual engagement to oscillate said plate.

12. The device defined by claim 10 in which said bridge member comprises a plurality of individual bridge elements, each of said elements being independently adjustable longitudinally and vertically with respect to said body.

13. The device defined by claim 10 in which the connection between said handle and said plate permits pivotal movement of said handle about an axis substantially perpendicular to said plate to bring said handle adjacent or remote from said strings as desired without causing oscillation of said bridge structure but with movement of said handle toward and from said plane effecting oscillation of said bridge structure.

14. The device defined by claim 12 in which said bridge member comprises a plurality of individual bridge elements, each of said elements being independently adjustable longitudinally and vertically with respect to said body.

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