

May 3, 1966

H. G. COLE

3,248,991

TREMOLO DEVICE FOR STRINGED INSTRUMENTS

Filed Sept. 10, 1963

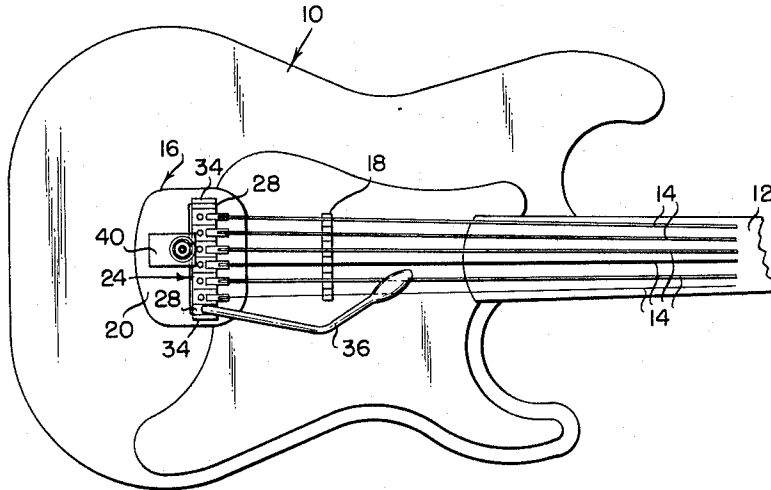


Fig. 1

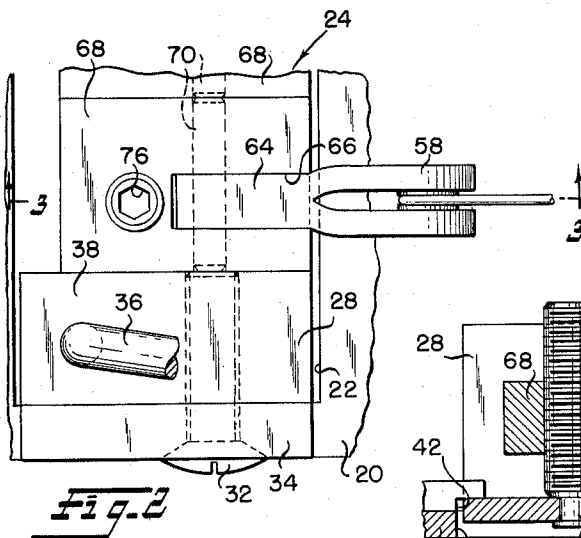


Fig. 2

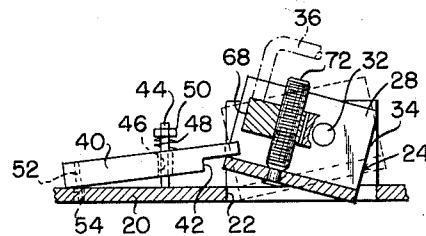


Fig. 3

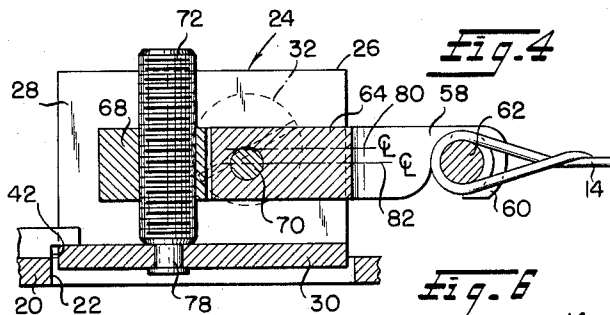


Fig. 4

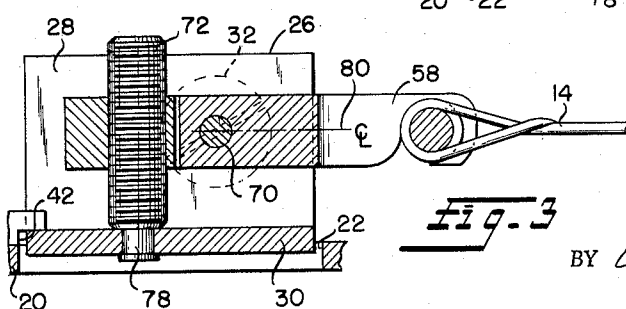


Fig. 5

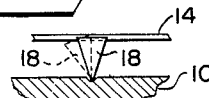


Fig. 6

INVENTOR
Harry G. Cole

BY *Winter, Ray, Adams & Johnson*

ATTORNEYS

1

3,248,991

**TREMOLO DEVICE FOR STRINGED
INSTRUMENTS**

Harry G. Cole, 10419 Hebard St., Kensington, Md.
Filed Sept. 10, 1963, Ser. No. 307,851
11 Claims. (Cl. 84—313)

The present invention relates to tremolo devices for stringed instruments such as guitars and similar lute-type instruments.

The present invention further relates to a method of tuning a tremolo-type stringed instrument.

It is an object of the present invention to provide a tremolo device which includes a member having cradle means and a separate floating bridge element or member, one for each string, for connecting the strings of the instrument thereto, which cradle means is so arranged as to have limited pivotal movement, so that the tension applied to the strings of the instrument can be readily varied to produce a tremolo effect.

It is another object of the present invention to provide a tremolo device with a separate floating bridge element for each separate string to which the string of the instrument can be connected so that all of the strings of the instrument may be individually and independently tuned, and can also be simultaneously moved together to produce a tremolo effect.

It is another object of the present invention to provide a tremolo device with a cradle member which carries a plurality of strings provided with means for independently adjusting each string eccentrically with respect to the pivotal movement of the cradle member so that the throw of each string with respect to the pivotal axis of the cradle member is independent of the throw of the other strings therefrom.

Various other objects and advantages of the present invention will be readily apparent from the following detailed description when considered in connection with the accompanying drawing forming a part thereof and in which

FIGURE 1 is a fragmentary top view of a guitar incorporating the invention;

FIGURE 2 is a fragmentary plan view, enlarged, of the tremolo device shown in FIGURE 1;

FIGURE 3 is a section taken along line 3—3 of FIGURE 2 illustrating one of the strings of the instrument carried by the cradle member of the tremolo device positioned in a neutral position so that pivotal movement of the cradle member will not cause any variation in the tension of the particular string;

FIGURE 4 is a section similar to FIGURE 3 but illustrating the string of FIGURE 3 disposed in an offset or eccentric position with respect to the pivotal axis of the cradle member;

FIGURE 5 is a fragmentary side elevational view, partly in section, illustrating the cradle member pivoted about its normal position so as to produce a tremolo effect; and

FIGURE 6 is a fragmentary detail view of one of the separate floating bridge members for a particular string.

Referring to the drawings, the reference numeral 10 generally designates the body of a guitar having a neck 12 terminating in a head, not shown. Strings 14 connected to the tremolo device 16 and extending over separate and individual floating bridge members or elements 18 and over the body 10 and neck 12, are provided.

A bridge member 18 is shown in side elevational detail in FIGURE 5, and it will be noted that the string 14 passes through a longitudinal groove in the top of bridge 18, and the bottom of 18 is freely disposed in a trans-

2

verse groove in body 10. Members 18 are V-shaped in cross sectional configuration, though they may have other shapes.

The tremolo device 24 is provided with a large, substantially flat middle plate 20 secured to the top of the body by any suitable means and disposed thereon adjacent the forward end. The front end of the body 10 is the portion thereof disposed opposite the neck 12. The plate 20 is provided with a transversely extending elongated slot 22 therein, adjacent which there is disposed the cradle means of the tremolo device. The cradle means consists of a U-shaped member 26 having two spaced vertical legs 28 and a substantially horizontal bottom 30. The horizontal bottom 30 extends transversely of the body 10, as is best seen in FIGURE 1, and beyond either side of the instrument strings to be connected to the cradle means as hereinafter described. The legs 28 are substantially rectangular in shape and form a block, while the horizontal bottom 30 is also substantially rectangular in shape and forms a block.

The U-shaped member 26 is supported for pivotal movement about a horizontal axis by members 32 disposed in upstanding vertical lugs or ears 34 provided on plate 20. The lugs 34 are substantially rectangular in cross-section and form blocks. The lugs 34 are disposed on opposite sides of the plate 20, as best seen in FIGURE 1, and are disposed longitudinally of the body 10 so as to be in alignment with the slot 22 in the plate 20. The horizontal members 32 comprise a headed screw member with the inner end thereof journaled in the vertical legs 28 so that the legs can rock or oscillate or be pivoted about the members 32. The members 32 are disposed in the lugs or ears 34 adjacent the rear portion thereof, or the portion toward the neck 12. The horizontal bottom 30 of the U-shaped member is positioned so that the lower edge thereof extends into the upper portion of the slot 22 when the U-shaped member is in a neutral position such as that shown on FIGURES 3 and 4, at which time the horizontal bottom 30 is disposed in a substantially horizontal plane.

A handle member 36 operated by the guitar player has its forward lower end extending into a recess in a vertical leg 28. The handle 36 is journaled in the forward end, or front end, 38 of leg 28 so that the handle can be raised or lowered in a vertical plane as well as rotated in a horizontal plane. The raising and lowering of the handle member 36 will cause the U-shaped member to pivot about the horizontal axis formed by the members 32.

The U-shaped member 26 is normally maintained in its neutral position or in its ordinary position when it is not desired to produce a tremolo effect by a plate member 40. The plate member 40 comprises a substantially rectangular block with a transversely extending cutout or slot 42 in the rear portion thereof, which rear portion overlies or overlaps the front end of the horizontal bottom 30 of the U-shaped member, as clearly shown in the drawings. The member 40 is secured to the plate 20 by a threaded member 44 extending through an enlarged recess 46 therein, and secured to the plate 20. The member 40 is biased against the plate 20 by a spring member 48 mounted on the threaded member 44 between the member 40 and a threaded nut 50. The front end or front portion of member 40 has a vertical pin 52 extending therethrough and through an enlarged slot 54 provided in the plate 20. The enlarged slots 46 and 54 permit the threaded member 44 and the pin 52 to readily stay out of contact with member 40 and plate 20, respectively, so that the member 40 can be fulcrumed about the pin 52 when the guitar player operates the handle 36 to pivot the U-shaped member about its pivot point and

overcome the force in spring 48 normally maintaining it in the horizontal position shown in FIGURES 3 and 4.

The individual strings 14 of the instrument are each connected to the cradle means by identical means so that the description for connecting one string thereto will serve to illustrate how all the strings are connected thereto.

The front end of the string 14 is connected to a bridge element 56 which is bifurcated at the rear end 58 thereof and is further provided with a turned-down or claw portion 60 adapted to receive an eyelet 62 therein carrying the front end of the instrument string 14. The eyelet 62 is provided with a circumferential recess therein around which the string is wound. The front end of the element 56 is necked-in as at 64, and is substantially vertical so as to extend into a vertical slot 66 in the rear end of a connector block member 68. The necked portion 64 of the element 56 is freely disposed within the slot 66 and is journaled on a pin or shaft 70 which extends through opposite sides of the block member 68 and through the slot 66 in a substantially horizontal direction. The block member 68 extends rearwardly a distance co-extensive with the rear side of the legs 28 while the forward ends of legs 28 extend beyond the front end of block member 68. The rear end 58 of the bridge element 56 extends substantially beyond the rear end of legs 28, as is clear from the drawings.

The block member 68 is rectangular shaped in cross-section as well as in top plan view, and is mounted on an externally threaded member 72 provided with a recess 76 in the top thereof adapted to receive an Allen wrench for turning or rotating the threaded member. The threaded member 72 is substantially vertical and has a bushing or adapter member 78 on the lower portion thereof journaled in the horizontal bottom 30 of the U-shaped member. Insertion of an Allen wrench in recess 76, and turning thereof, will cause the threaded member 72 to raise or lower the block member 68 in a vertical direction. The vertical plane of the pin or shaft 70 and the vertical plane of the member 32 coincide with each other, and the externally threaded member 72 is disposed so that it is spaced forward of these coinciding vertical planes and toward the front end of the body. Thus, adjustment of the connector block member 68 in a vertical direction or in an upward or downward direction will not cause the vertical planes of the respective members 70 and 32 to change with respect to each other or become non-coincident. However, adjustment of the connector block member 68 in a vertical direction by the threaded member 72 will cause the center line 80 of the member 32 and the center line 82 of the pin member 70 to be displaced relative to each other so that the connector block member 68 is offset, or eccentrically positioned with respect to the center line 80 of the member 32. The strings 14 will not break at this time, and there will be no rubbing on the individual and separate floating bridge 18 of the particular string being adjusted, because its respective bridge 18 fulcrums about its bottom in the transverse groove in body 10 in which it is disposed, as illustrated by dotted lines in FIGURE 6. When the connector block member 68 has its center line 82 coincident with, or coinciding with the center line 80 of the member 32, the connector block member 68 is in a neutral position, as shown in FIGURE 3. At this time when the handle member 36 is raised or lowered by the guitar player and the U-shaped member is pivoted about the member 32, as illustrated in FIGURE 5, the particular connector block member 68 and the particular instrument string 14 connected thereto will not move but will be in a neutral position so that there will be no change in the tuning effect of this particular string and no tremolo effect will take place. Thus, with a plurality of strings 14 on a guitar instrument it is apparent that each individual string can be independently and individually displaced or adjusted with respect to the center line 80 of the member

32 so that they can all be individually tuned initially with respect to each other.

After they have once been initially tuned by raising or lowering the particular connector block member 68 to which each is attached, it is apparent that by the raising and lowering of the handle member 36 the entire set of strings 14 can be moved in unison and simultaneously about the pivot point defined by the longitudinal axis of the member 32. It is also apparent that the biasing force in the spring member 48 will always cause the front end of the U-shaped member to return to its neutral position, at which time it is in a substantially horizontally disposed position, when the guitar operator or player releases the handle member 36.

From the foregoing description it will be noted that the present invention provides a novel tremolo device for attaching thereto a plurality of instrument strings, which strings can be independently and individually adjusted with respect to the cradle means or U-shaped member thereof so as to be tuned individually with respect to each other, and which can also be simultaneously pivoted or moved about a pivot point together so as to produce a tremolo effect.

The present invention also provides a novel, simple and compact, and inexpensive floating bridge device for connecting a plurality of instrument strings thereto in which the throw or offset or eccentricity of each string can be independently controlled with respect to the other strings attached thereto.

Inasmuch as changes may be made in the form, location, and relative arrangement of several parts of the invention without departure from the principles of the invention, it is understood that the invention is not to be limited excepting by the scope of the appended claims.

The present invention provides a plate member 40 which works against a fixed stop and prevents any detuning of the remaining strings, if any one string is broken, which frequently occurs in a balanced plate tremolo device.

What is claimed is:

1. A musical instrument comprising a body and strings extending thereover, plate means secured to said body, cradle means pivotally connected to said plate means for pivotal movement about a transverse axis of said body, connector means carried by said cradle means including a horizontal member for each string, said strings being attached to said connector means, individual adjusting means for individually and independently offsetting each of said connector means a vertical distance from said transverse axis and for moving said connector means downwardly to coincide with said transverse axis, and a floating bridge member for each of said strings fulcrumed on said body with its respective string passing thereover.

2. The instrument of claim 1 wherein said cradle means includes a U-shaped member extending transversely of said body, and spaced horizontal pins pivotally connect said U-shaped member about said transverse axis.

3. The instrument of claim 2 wherein biasing means are provided to bear against said U-shaped member to normally maintain it in a horizontal plane.

4. A musical instrument comprising a body and strings extending thereover, a plate member secured to said body with spaced upstanding members, a horizontally disposed cradle means pivotally connected between said upstanding members for pivotal movement about a transverse axis of said body, biasing means normally maintaining said cradle means in a horizontal position, individual connector means secured to said cradle means to each of said strings, said connector means each having a transverse axis coinciding with said first mentioned transverse axis, means for pivoting said cradle means from said horizontal position whereby upon vibration of said strings a tremolo effect is produced, means for independently displacing each of said connector means, and its correspond-

5

6

ing transverse axis away from said first mentioned transverse axis and to a position coincident with said first mentioned transverse axis, and individual floating bridge members for each string spaced from said cradle means and fulcrumed on said body with its respective string extending over and through a longitudinal slot in said bridge member.

5. The instrument of claim 4 wherein said cradle means includes a U-shaped member, and is pivotally connected to said upstanding members by spaced horizontal members secured to the legs of said U-shaped member and journaled in said upstanding members.

6. The instrument of claim 5 wherein each connector means is a horizontal block with a horizontal pin defining its transverse axis, and each of said strings is attached to its corresponding connector means by a bifurcated element through which said horizontal pin extends.

7. A musical instrument comprising a body and wire tensioned strings extending thereover, a plate member secured to said body with laterally spaced vertical members, a cradle member with vertical spaced legs and a horizontal bottom extending between the lower ends of said vertical legs, said vertical legs being disposed adjacent the inner sides of said vertical members, a horizontal transverse pin member pivotally connecting adjacent vertical members and legs to each other so that said horizontal bottom is pivotally moveable about a transverse axis of said body, a biasing plate member secured to said first-mentioned plate member and overlapping the upper edge of said horizontal bottom, biasing means bearing against the top of said biasing plate member to maintain it in contact with said top, handle means for pivotally moving said horizontal bottom about said pin members and said overlapping biasing plate member upwardly, a plurality of connector block members disposed over said horizontal bottom, a vertical threaded member secured to each of said block members and to said horizontal bottom for moving said block members upwardly and downwardly with respect to said bottom, a horizontal and transverse pin extending through each of said block members, a bridge element pivotally

connected to each of said bridge elements, and each of said block pins having its axis disposed longitudinally of said body at a portion which coincides with said transverse body axis, whereby said strings can be independently tuned with respect to each other and all said strings can be simultaneously moved together about said transverse body axis to produce a tremolo effect.

8. The instrument of claim 7 wherein said first-mentioned pin members are disposed adjacent the rearward side of said vertical members and legs.

9. The instrument of claim 8 wherein said plate member is provided with a transverse slot therein adjacent said horizontal bottom and said bottom extends therein.

10. The instrument of claim 9 wherein said bridge elements extend longitudinally of said body and have said block pins extending through their front ends and are bifurcated adjacent their rear ends and recesses are provided to receive eyelets connected to said strings.

11. The instrument of claim 9 wherein said biasing plate member provides a fixed stop so that tuning or breakage of any string will not affect the tonal quality or tuning of the remaining strings and eliminates re-tuning as is common in a balanced type plate tremolo.

References Cited by the Examiner

UNITED STATES PATENTS

1,839,395	1/1932	Kauffman	84—313
2,491,991	12/1949	Lundback	84—307
2,741,146	4/1956	Fender	84—313
2,788,694	4/1957	Dearth	84—312
3,174,381	3/1965	Matthew et al.	84—313
3,181,409	5/1965	Burns et al.	84—313

FOREIGN PATENTS

905,477 9/1962 Great Britain.

LOUIS J. CAPOZI, *Primary Examiner*.

LEO SMILOW, *Examiner*.

CHARLES M. OVERBEY, *Assistant Examiner*.