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INDIVIDUAL STRING TONE CHANGER FOR GUITARS

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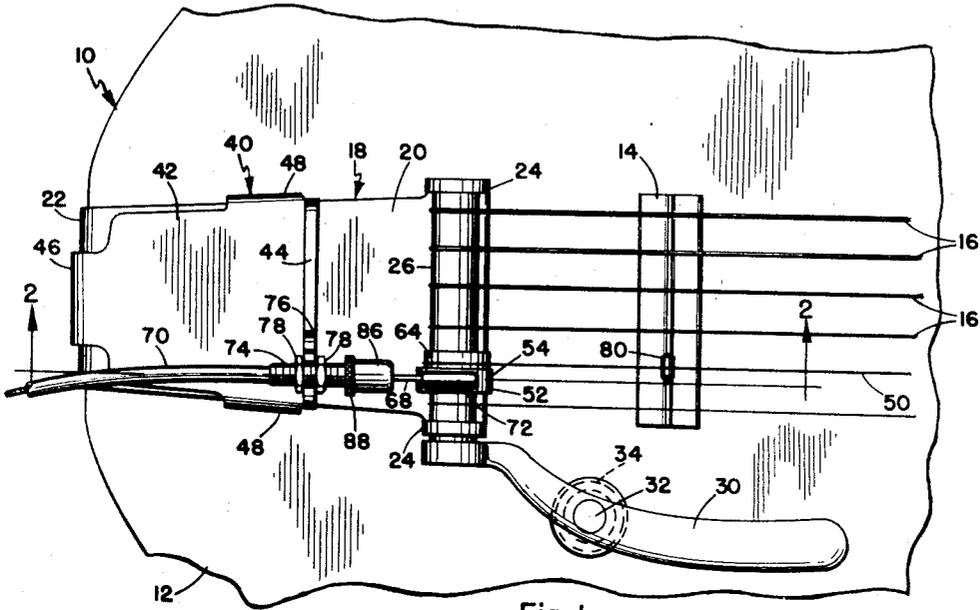


Fig. 1

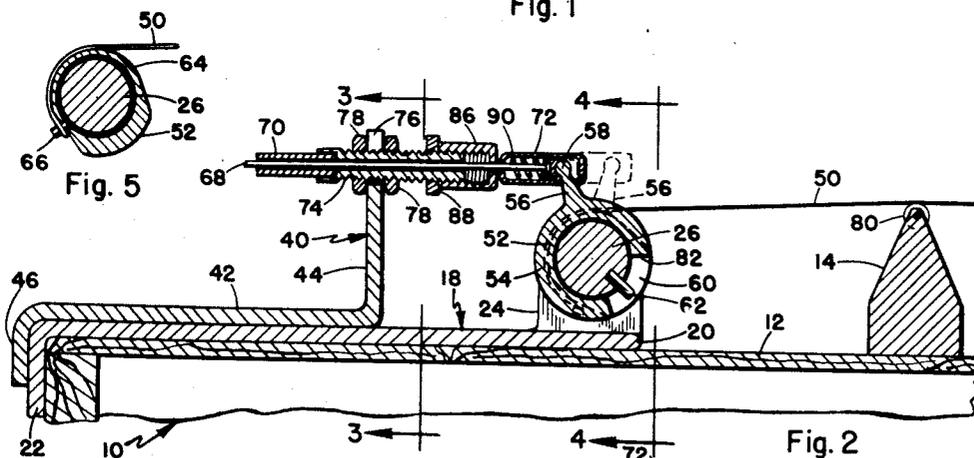


Fig. 2

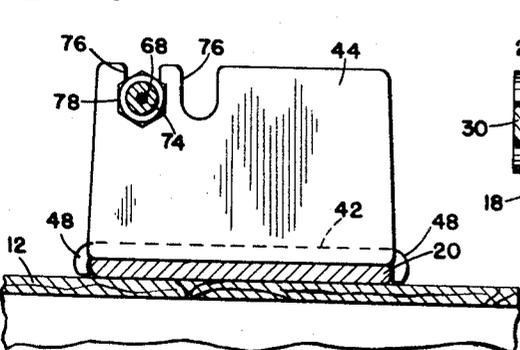


Fig. 3

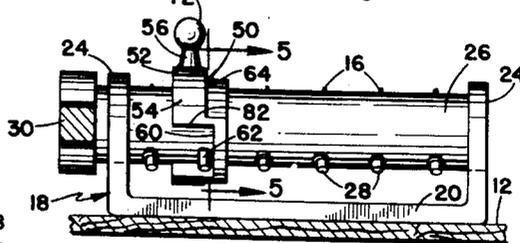


Fig. 4

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INDIVIDUAL STRING TONE CHANGER FOR GUITARS

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9 Claims. (Cl. 84—297)

The present invention relates generally to stringed musical instruments and more particularly to an individual string tone changer for guitars.

The primary object of this invention is to provide a tone changer for an individual string of a guitar or like instrument which can be operated by a foot pedal while playing to introduce new effects and chord combinations without the usual fingering changes.

Another equally important object of this invention is to provide an individual string tone changer which can be added to a conventional hand actuated vibrato mechanism which operates all strings simultaneously, without any actual structural modification to the vibrato mechanism.

Another object of this invention is to provide a string tone changer which can be accurately adjusted to control the tone change to avoid discords.

Another object of this invention is to provide an individual string tone changer which is adapted for fabrication from many different materials, so that the choice of material can be according to the dictates of availability and price considerations, the exact sizes and proportions being matters easily determined to suit particular conditions and needs.

Another object of this invention is to provide an individual string tone changer which is practicable and inexpensive to manufacture.

Finally, it is an object to provide an individual string tone changer of the aforementioned character which is simple and convenient to operate and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawing which forms a material part of this disclosure, and in which:

Figure 1 is a fragmentary top plan view of a guitar showing the string tone changer combined with a vibrato mechanism;

Figure 2 is an enlarged fragmentary sectional view taken on the line 2—2 of Figure 1; showing the mechanism actuated;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a sectional view taken on the line 4—4 of Figure 2; and

Figure 5 is a sectional view taken on the line 5—5 of Figure 4.

Similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing.

Referring now to the drawing in detail, the guitar instrument, of conventional construction, has a body 10 with a top panel 12 on which is mounted a raised bridge 14 over which the strings 16 are strung. The guitar as illustrated is fitted with a vibrato unit 18 having an anchor

plate 20, one end 22 of which is turned downwardly over the end of the body 10 to secure the anchor plate in place. At the other end of the anchor plate 20 are two upstanding, opposed brackets 24 between which is supported an anchor bar 26 extending transversely of the body 10 and which is rotatable in said brackets. Fixed in the anchor bar 26 are a plurality of spaced pins 28 arranged longitudinally along the bar, the strings 16 being terminally attached to said pins. The other ends of the strings 16 are secured to conventional screw type adjusting devices not shown in the drawing. The anchor bar 26 extends beyond one of the brackets 24 and has a hand lever 30 fixed thereto, said lever extending alongside the strings 16 and being supported on a post 32 on which is a spring 34. This type of vibrato mechanism is well known, the lever 30 being spring biased to hold the anchor bar 26 in one position with the strings 16 all tuned. When the lever 30 is depressed or raised, the anchor bar 26 is rotated slightly and varies the tension on all the strings 16, so changing their tone collectively. With such a mechanism an oscillating or vibrato chord effect is obtained, but the tone change is variable and has no precise limits.

It is conceived that the hereindescribed and claimed individual string tone changer is capable of combination with structure other than the above described vibrato mechanism, but in any case some such structure as the anchor bar 26 must be present.

The present tone changing device is illustrated as added to the vibrato unit 18 to provide accurate tone change of one string within precise limits. The tone changer assembly 40 includes a base plate 42 having an upwardly extending support plate 44 at one end and a downwardly turned tail plate 46 at the other end. The base plate 42 rests on top of the anchor plate 20 with the tail plate 46 bearing against the end 22, the forward end of said base plate adjacent the support plate 44 having opposed side flanges 48 which are turned downwardly and inwardly to grip the edges of said anchor plate. The single string to be used, which, as illustrated, is the second string identified by the numeral 50, is not secured to its pin 28. Instead a small drum 52 is mounted rotatably on the anchor bar 26 in the position of the string 50 and the string is attached to the drum. The drum 52 has a cylindrical portion 54 on which is a radially extending post 56 having a ball end 58, said cylindrical portion having a slot 60 to fit around the pin from which the string 50 has been removed, this particular pin now serving as a stop pin and being indicated at 62. At one side of the cylindrical portion 54 is a reduced diameter shoulder 64 extending around the greater portion of the periphery of the drum 52 and fixed in said shoulder is a retaining pin 66 to which the string 50 is secured, said string wrapping around the shoulder instead of on the anchor bar 26.

The drum 52 is actuated by a flexible cable 68 enclosed in a sheath 70, this type of cable being well known, the end of said cable having a conventional snap-on type retainer fitting 72 which clamps on the ball end 58. Other cable end attachments may be equally suitable. The cable 68 is supported in a screw threaded sleeve 74 which rests in a notch 76 in the top edge of support plate 44 in longitudinal alignment with the post 56, said sleeve being held in place by nuts 78. Additional notches 76 may be provided in the support plate 44 so that the mechanism may be applied to other strings as desired. The cable 68 is connected to a suitable foot pedal, not shown, several types being available for use with similar mechanisms. To ensure free movement of the string 50 and to minimize wear, a small roller 80 may be mounted in the bridge 14 under the string in question. The end 82 of the slot 60 acts as a stop against the stop pin 62 as described hereinafter.

When the foot pedal is depressed, the cable 68 is pulled and causes the drum 52 to rotate, so increasing the tension on string 50 and raising its resonant frequency. The tone change is adjusted by means of an internally screw threaded collar 86 axially adjustable on the sleeve 74, said collar being locked in place by a knurled lock nut 88. The distance between the retainer fitting 72 and the collar 86 controls the movement of the cable 68 and thus limits the rotation of drum 52, so that the true tone change is obtained when said retainer fitting strikes said collar, as in Figure 2. In the retainer fitting 72, a spring 90 holds the end of cable 68 against the ball end 58 and this spring has an additional function in the operation of the mechanism. When the foot pedal control is operated and the retainer fitting 72 strikes the collar 86, further movement of the foot pedal merely compresses the spring 90 instead of applying a damaging pull on the cable 68, said spring thus acting as a resilient override buffer. When the cable 68 is relaxed, the natural tension in the string 50 returns the drum 52 to its normal position with the stop 82 bearing on the stop pin 62, and it is at this position that the string is initially tuned. By using the foot pedal control, the string 50 can be raised a full tone or a half tone according to the adjustment of the mechanism.

It is important to note that, when the foot pedal control is not used, the vibrato unit changes the pitch of the string 50 in concert with the changes made in the pitch of the other strings 16. It is also noteworthy that, when playing the instrument, the vibrato unit operates all strings together in the normal manner, the tone changer assembly operates one string only but when the single string is raised in pitch, the vibrato unit does not effect that string. The tone changer enables a player to make changes in the character of a chord at any time and produces a novel effect not obtainable with other types of string adjusting devices. The effect is somewhat like an effect obtainable with a steel guitar, but the tone change is sharp without pronounced slurring. A similar tone change can be produced by fingering, which may be difficult to accomplish in certain note combinations due to the relative positions of all fingers, but again the tone change is slurred as the finger moves from one fret to another on the keyboard.

The present invention can be properly considered as an improved vibrato assembly wherein one string can be individually controlled. However, the tone changer assembly can be added to a conventional vibrato mechanism without modification to the existing structure and does not interfere with normal playing of the instrument. As illustrated, the structure is designed for attachment to existing vibrato equipped instruments. However, it should be understood that the tone changer can easily be made integral with the vibrato mechanism as a single unit.

The operation of this invention will be clearly comprehended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It will be obvious that all said objects are amply achieved by this invention.

It is understood that minor variation from the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

1. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of strings terminally secured to said anchor bar; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said

anchor bar; a single string terminally secured to said drum; and remotely controlled actuating means connected to said drum to rotate the drum and vary the tension on said single string.

2. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of strings terminally secured to said anchor bar; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said anchor bar; a single string terminally secured to said drum; stop means on said anchor bar to limit the movement of said drum relative to said bar; and remotely controlled actuating means connected to said drum to rotate the drum and vary the tension on said single string.

3. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of pins fixed in said anchor bar; a plurality of strings terminally secured to all but one of said pins; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said anchor bar; said drum having a slot therein straddling said one pin; the ends of said slot constituting stops and said one pin comprising a stop pin engageable with said stops to limit the rotation of said drum; a single string terminally secured to said drum; and remotely controlled actuating means connected to said drum to rotate the drum and vary the tension on said single string.

4. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of pins fixed in said anchor bar; a plurality of strings terminally secured to all but one of said pins; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said anchor bar; said drum having a slot therein straddling said one pin; the ends of said slot constituting stops and said one pin comprising a stop pin engageable with said stops to limit the rotation of said drum; a reduced diameter shoulder on said drum; a fixed retaining pin in said shoulder; a single string passing around said shoulder and terminally secured to said retaining pin; and remotely controlled actuating means connected to said drum to rotate the drum and vary the tension on said single string.

5. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of pins fixed in said anchor bar; a plurality of strings terminally secured to all but one of said pins; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrator unit; said tone changer including a drum rotatably mounted on said anchor bar; said drum having a slot therein straddling said one pin; the ends of said slot constituting stops and said one pin comprising a stop pin engageable with said stops to limit the rotation of said drum; a single string terminally secured to and passing around said drum; a post extending substantially radially from said drum; and a remotely actuated flexible cable attached to said post to rotate said drum and vary the tension on said single string.

6. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of pins fixed in said anchor bar; a plurality of strings terminally secured to all but one

of said pins; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said anchor bar; said drum having a slot therein straddling said one pin; the ends of said slot constituting stops and said one pin comprising a stop pin engageable with said stops to limit the rotation of said drum; a single string terminally secured to and passing around said drum; a post extending substantially radially from said drum; and a remotely actuated flexible cable attached to said post to rotate said drum and vary the tension on said single string; a fixed support adjacent said anchor bar; a sleeve secured to said support; said cable passing slidably through said sleeve; and means for adjusting the distance between said sleeve and said post.

7. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of strings terminally secured to said anchor bar; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said anchor bar; a single string terminally secured to said drum; means to rock said drum, independently of said anchor bar, to vary the tension of said single string; said drum being rocked with said anchor bar when said drum is in one position relative to said anchor bar.

8. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of pins fixed in said anchor bar; a plurality of strings terminally secured to all but one of said pins; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer including a drum rotatably mounted on said anchor bar; said drum having a slot therein straddling said one pin; the ends of said slot constituting stops and said one pin comprising a stop pin engageable with said

stops to limit the rotation of said drum; a single string terminally secured to and passing around said drum; a post extending substantially radially from said drum; a fixed support adjacent said anchor bar; a sleeve secured to said support; a remotely actuated flexible cable operatively mounted in said sleeve; a retainer fitting terminally secured to said cable and attached to said post; and a collar axially adjustable on said sleeve to vary the distance between said collar and said retainer fitting, thereby limiting the movement of said cable.

9. In combination in a stringed musical instrument: a vibrato unit fixed at one end of the instrument; said vibrato unit having an anchor bar rotatably mounted therein; a plurality of pins fixed in said anchor bar; a plurality of strings terminally secured to all but one of said pins; means for rotatably rocking said anchor bar to vary the tension on said strings collectively; and a tone changer assembly mounted on said vibrato unit; said tone changer including a drum rotatably mounted on said anchor bar; said drum having a slot therein straddling said one pin; the ends of said slot constituting stops and said one pin comprising a stop pin engageable with said stops to limit the rotation of said drum; a single string terminally secured to and passing around said drum; a post extending substantially radially from said drum; and a remotely actuated flexible cable attached to said post to rotate said drum and vary the tension on said single string; and said flexible cable having a resilient end connection with said post, whereby excess movement of said cable is absorbed by the resiliency of said connection.

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