

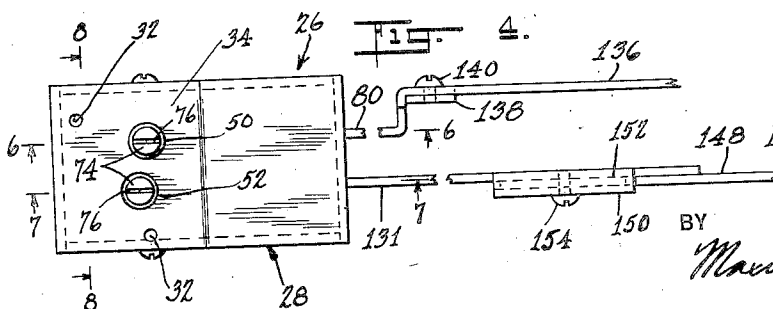
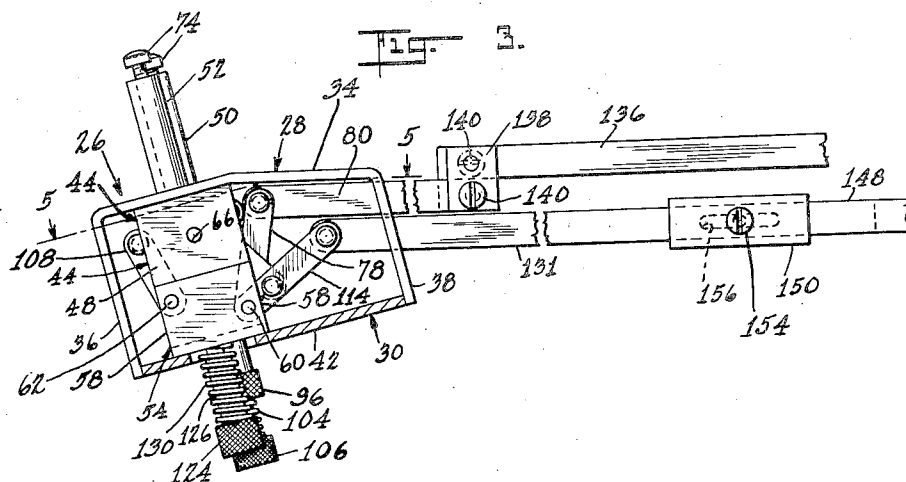
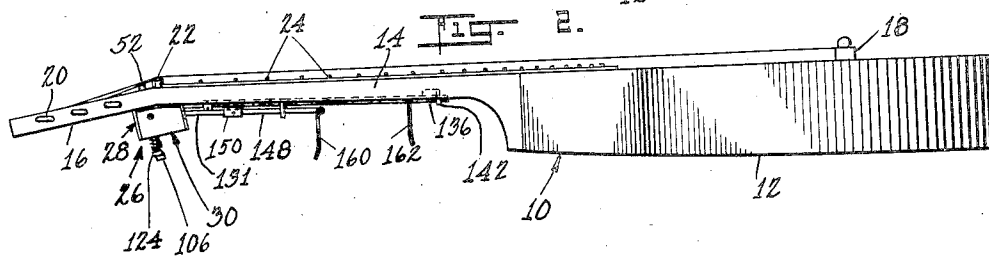
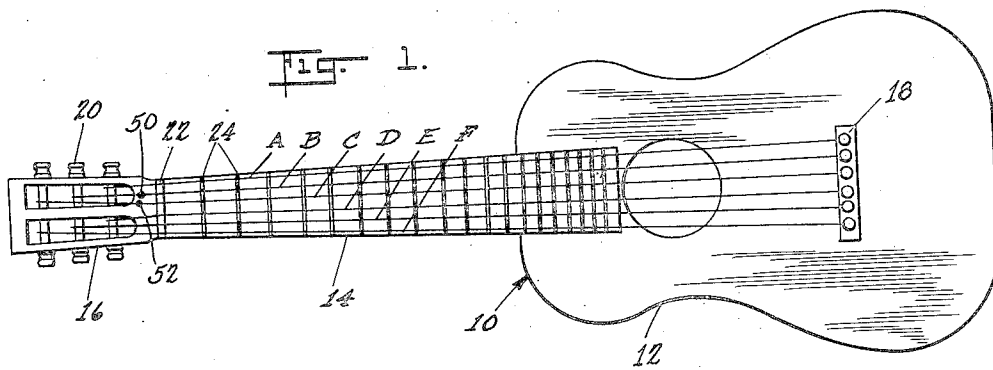
May 12, 1936.

E. F. SCHULZ

2,040,633

ATTACHMENT FOR MUSICAL INSTRUMENTS

Original Filed June 10, 1933 3 Sheets-Sheet 1



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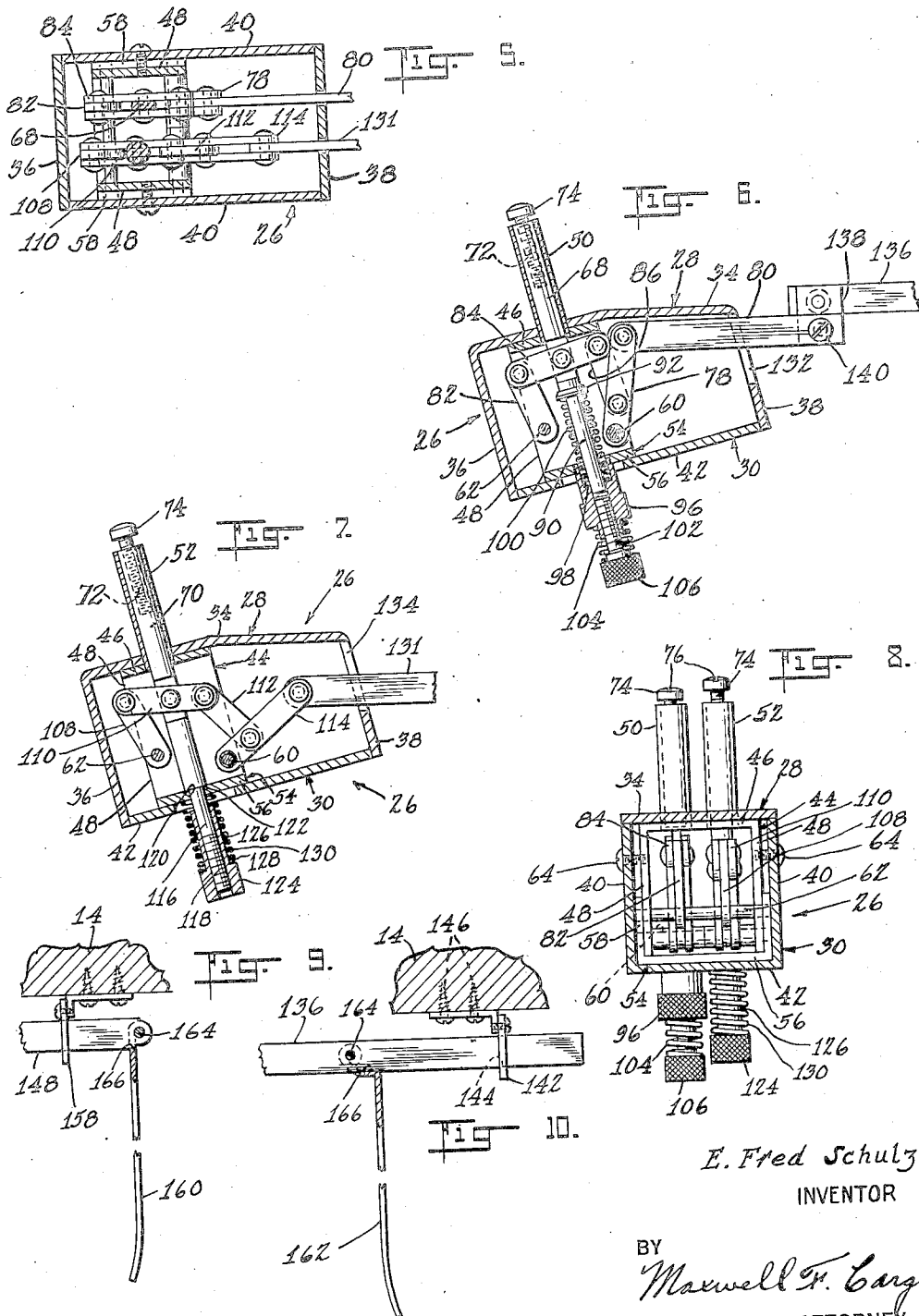
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ATTACHMENT FOR MUSICAL INSTRUMENTS

Original Filed June 10, 1933 3 Sheets-Sheet 2



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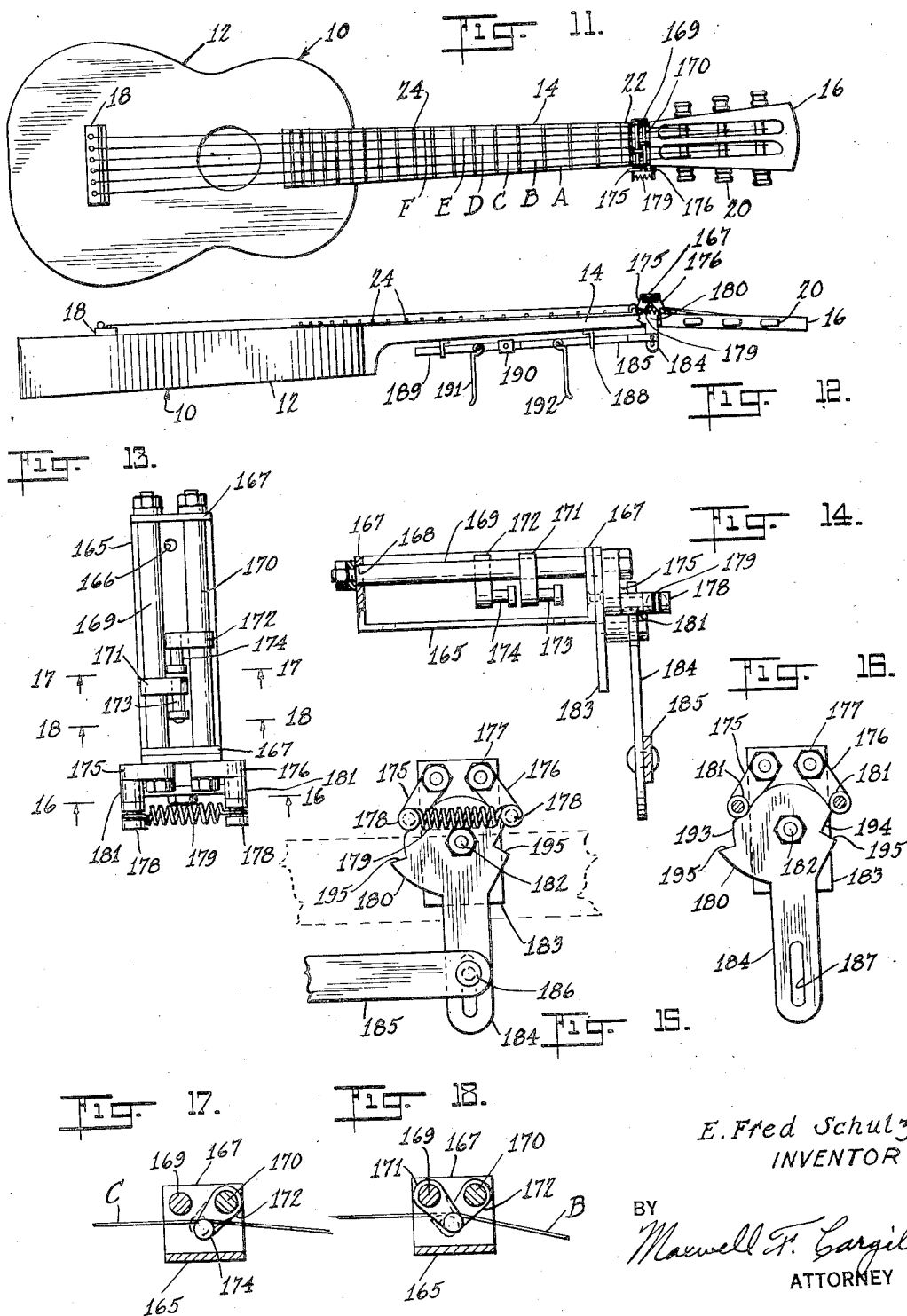
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ATTACHMENT FOR MUSICAL INSTRUMENTS

Original Filed June 10, 1933 3 Sheets-Sheet 3



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2,040,633

ATTACHMENT FOR MUSICAL
INSTRUMENTS

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Application June 10, 1933, Serial No. 675,194
Renewed October 5, 1935

12 Claims. (Cl. 84—312)

My invention relates to improvements in at-
tachments for musical instruments of the string
type and consists in the combinations, construc-
tions and arrangements herein described and
claimed.

An object of my invention is to provide an at-
tachment for a stringed musical instrument, par-
ticularly of the guitar type, which will enable the
player to change the tones of certain of the
strings while the instrument is being played, by
means other than that normally employed for
playing the instrument, whereby a greater num-
ber of chords may be obtained when the strings
are picked or played in combination than would
otherwise be obtainable.

A further object of my invention is to provide
an attachment for a stringed musical instrument,
which includes means manually operable by the
player for changing the tension of a string while
the instrument is being played for causing the
open string to produce a different tone, when
picked, from that which it would normally pro-
duce, and thereby enabling the player to obtain a
greater number of chords when the string is
picked or played in combination with the other
strings than would otherwise be obtainable.

A further object of my invention is to provide
an attachment for stringed musical instruments
of the type set forth above, which may be quickly
and easily adjusted for determining the proper
tensions of the strings, and the resultant tones
thereof.

A further object is to provide an attachment
for stringed musical instruments of the type set
forth above, which is simple in construction and
which may be conveniently and easily actuated.

Other objects and advantages will appear in
the following specification, and the novel fea-
tures of the invention will be particularly pointed
out in the appended claims.

My invention is illustrated in the accompany-
ing drawings, forming part of this application, in
which

Figure 1 is a top plan view of a guitar showing
my invention connected therewith,

Figure 2 is a side elevation of a guitar showing
my invention connected therewith,

Figure 3 is a detail elevational view of my de-
vice, a side portion thereof being removed.

Figure 4 is a top plan view of the device shown
in Figure 3,

Figure 5 is a detail sectional view taken sub-
stantially along the lines 5—5 of Figure 3,

Figure 6 is a vertical sectional view taken sub-
stantially along the lines 6—6 of Figure 4,

Figure 7 is a vertical sectional view taken sub-
stantially along the lines 7—7 of Figure 4,

Figure 8 is a vertical sectional view taken sub-
stantially along the lines 8—8 of Figure 4,

Figures 9 and 10 are detail views of portions of
my invention,

Figure 11 is a top plan view of a guitar show-
ing a modified form of my invention connected
therewith,

Figure 12 is a side elevation of the guitar shown
in Figure 11 and the modified form of my in-
vention connected therewith,

Figure 13 is a top plan view of the form of my
invention illustrated in Figures 11 and 12,

Figure 14 is a front elevation of the structure
shown in Figure 13, a portion being shown in sec-
tion,

Figure 15 is an end elevation of the structure
shown in Figures 13 and 14,

Figure 16 is a section taken along the lines
16—16 of Figure 13,

Figure 17 is a section taken along the lines
17—17 of Figure 13, and

Figure 18 is a section taken along the lines
18—18 of Figure 13.

In carrying out my invention I make use of a
stringed instrument such as a guitar 10 which
comprises a body portion or sound box 12 having
a neck 14 connected therewith which terminates
in a head portion 16. Strings A, B, C, D, E, and
F have ends connected with a bridge 18 which is
connected with the body portion 12 and have
their opposite ends connected with keys 20 by
means of which their tensions may be varied for
determining the desired tones thereof.

The strings extend over a nut 22 which is po-
sitioned adjacent the junction of the head por-
tion 16 with the neck 14, and against which the
strings bear.

At this point it will be noted that when the
strings A, B, C, D, E, and F are picked either
singly or in combination their tones will be
changed only by the player positioning his fingers
between the frets 24 connected with the neck 14.

My invention has been illustrated as being as-
sociated with the strings B and C, and comprises
a casing or housing 26 which in turn comprises
a top U-shaped member 28 and a bottom U-
shaped member 30 transversely positioned with
respect to each other. The top U-shaped member
is connected with the head portion 16 of the in-
strument by any suitable means such as screws
which may extend through openings in the head
portion and into threaded openings 32 in the top

side 34 of the top U-shaped member as shown in Figure 4.

The top U-shaped member provides end walls 36 and 38 and the bottom U-shaped member provides side walls 40 and a bottom wall 42.

As shown in Figures 3, 6, 7, and 8 an inner top U-shaped member 44 is disposed in the casing and comprises a top portion 46 and spaced apart side portions 48. The inner top U-shaped member 44 is transversely positioned with respect to top U-shaped member 28, so that the sides 48 thereof are disposed in substantially parallel spaced apart positions with respect to the side walls 40 of the bottom U-shaped member 30.

The top portion 46 of the U-shaped member 44 may be fixedly connected with the top side 34 of the top U-shaped member 28 by spot welding or by a pair of upwardly extending tubular members 50 and 52 extending through aligned openings in the top portion 46 and the top side 34.

An inner bottom U-shaped member 54 comprises a bottom portion 56 positioned between the ends of the sides 48 and the bottom wall 42 and sides 58 which extend over the sides 48 of the inner top U-shaped member 44.

The sides 48 and 58 are connected together by a pair of stationary shafts or pivot pins 60 and 62 which extend through aligned openings in the sides. The shafts 60 and 62 are retained against longitudinal movements by the sides 40 and perform another function in addition to connecting the members 44 and 54 which will be set forth hereinafter.

The U-shaped member 30 is connected with the U-shaped member 44 by means of screws 64 which extend through openings in the sides 40 and are receivable in threaded openings 66 in the sides 48 of the member 44 as shown in Figures 3 and 8.

Piston elements 68 and 70 are slidably disposed in the tubular members 50 and 52, respectively, and are provided with threaded openings 72 therein for receiving screws 74 having slots 76 in ends thereof.

The tubular members 50 and 52 extend through openings in the head portion 16 of the instrument and the strings B and C are disposed in the slots of the screws connected with the piston elements 68 and 70 respectively.

The piston element 68 associated with the string B is adapted for being moved downwardly for varying the tension of the string and the piston element 70 is adapted for being moved upwardly for varying the tension of the string C with which it is associated.

The structure for actuating the piston elements will now be described. Upon referring to Figure 6 it will be noted that an arm 78 is pivotally mounted on the shaft 60 and has an end thereof pivotally connected with an actuating rod 80. In like manner an arm 82 is pivotally mounted on the shaft 62 and has an end thereof pivotally connected with an arm 84 which in turn is pivotally connected with the piston element 68. An arm 86 is also provided having the ends thereof pivotally connected with the arms 84 and 78. The piston element 68 is provided with a reduced portion, and a circumferential flange portion 92 which is positioned at the juncture of the reduced portion 90 with the portion of the piston element having the larger diameter.

The member 54 is provided with a threaded opening therein for receiving a spring retaining member 96 which has an axial passageway therein for receiving the reduced portion 90.

A portion of the passageway is of greater diameter than the reduced portion 90 for providing a shoulder 98. A compression spring 100 is disposed on the reduced portion 90 and bears against the shoulder 98 and the flange portion 92.

The spring retaining member 96 may be adjusted with respect to the member 54 in order that the pressure exerted by the spring 100 against the flange portion 92, may be made substantially equal to the opposite pressure exerted by the normal tension of the string B against the screw 74 of the piston element 68.

Thus it will be seen that the spring 100 tends to hold the piston element 68 in its uppermost position shown in Figure 6, but that when the rod 90 is moved to the right as viewed in Figure 6, the piston element will be moved downwardly against the tension of the spring 100 thereby decreasing the tension on the string B and thereby changing its tone.

The spring retaining member 96 has an end portion of its axial opening therethrough threaded for receiving an adjustment screw 102. The position of the adjustment screw 102 with respect to the spring retaining member 96 determines the distance that the piston element 68 can be moved downwardly and thereby enables the player to determine the proper tone of the string B when the arm 80 is moved.

A spring 104 is positioned between the head 106 of the screw 102 and the spring retaining member 96 for preventing free rotation of the adjusting screw 102.

On referring to Figure 7 it will be noted that arms 108, 110, 112, and 114 are operatively associated with the shafts 60 and 62 and the piston element 70 in a manner similar to that in which the arms 82, 84, 86, and 78 respectively are associated with the shafts 60 and 62 and the piston elements 68. The piston element 70 is provided with a reduced portion 116 the end portion of which is threaded as at 118. The reduced portion 116 extends through an opening 120 in the member 54 and provides a shoulder 122 which is normally in engagement with the member 54.

An adjustment screw 124 is disposed on the threaded end portion 118 and is provided with a reduced portion 126 for providing a shoulder 128. A spring 130 is disposed on the reduced portion 126 and abuts the shoulder 128 and the member 54.

The spring 130 tends to retain the piston element 70 in its lowermost position shown in Figure 7. An actuating rod 131 is pivotally connected with the arm 114, and when the actuating arm 131 is moved to the left, as viewed in Figure 7, the piston element 70 and the adjustment screw 124 will be moved upwardly for increasing the tension of the string C, thereby causing string C to produce a higher tone. The piston element 70 will be moved upwardly until the reduced portion of the adjustment screw 124 abuts the member 54 and therefore it will be seen that the position of the adjustment screw with respect to the reduced portion 116 determines the increased tension which it is desired to give to the string C for producing a higher tone.

It will be noted that the bottom wall 42 of the member 30 is provided with an opening therein sufficiently large to enable the piston elements and the elements associated therewith to extend through the opening and be unimpeded in their movements.

The actuating rods 80 and 131 extend through

slotted openings 132 and 134, respectively, in the end wall 38 of the top U-shaped member 28.

The actuating rod 80 is connected with an offset rod 136 by means of a connecting link 138 and screws 140. The offset rod 136 extends beneath the neck 14 and is slidably connected therewith by a connecting element 142 having a slotted opening 144 therethrough through which the offset rod 136 slidably extends.

The connecting element 142 is connected with the neck 14 by any suitable means such as screws 146.

An extension rod 148 is connected with the actuating rod 131 by means of a connecting member 150 having spaced apart side flanges 152 for receiving the rods 131 and 148 therebetween. A screw 154 extends through an opening in the connecting member and a slotted opening 156 in the extension rod and is receivable in a threaded opening in the actuating rod 131, the extension rod being positioned between the actuating rod 131 and the connecting member 150.

This construction provides for a longitudinal adjustment of the extension rod 148 with respect to the actuating rod 131.

A connecting element 158 through which the extension rod 148 slidably extends, is provided for slidably connecting the extension rod 148 with the neck 14. The connecting element 158 is similar to the connecting element 142 and is connected with the neck 14 in a manner similar to that for connecting the element 142.

Depending and manually operable lever arms 160 and 162 have ends pivotally connected with the extension rod 148 and the offset rod 136, respectively, by means of pivot pins 164.

The pivotal ends of the lever arms are slotted for receiving their respective rods and provide shoulders 166 which abut their respective rods when the lever arms are in their depending positions, whereby the extension rod 148 may be moved to the left when the lever arm 160 is moved to the left, and the offset rod 136 may be moved to the right when the lever arm 162 is moved to the right, as viewed in Figures 2, 9, and 10.

The pivotal ends of the lever arms 160 and 162 may be in frictional engagement with their respective rods in order that when the lever arms are swung upwardly substantially parallel to the rods 148 and 136, at which time they are in non-operating positions, they may be retained in these positions.

From the foregoing description of my device the operation thereof may be readily understood.

When the instrument is to be played, the player assumes a sitting posture, with the body 12 of the instrument resting on the right leg and the neck 14 extending over the left leg, the left leg being positioned between the lever arms 160 and 162.

The player holds a bar member or steel in his left hand which he moves over the strings and picks the strings with his right hand, the position of the steel on the strings with respect to the frets 24 determining the tones of the strings.

When the steel is not held in engagement with a string, that string is said to be an open string, and the tone resulting when an open string is picked is said to be an open tone.

When during the course of playing the instrument the player desires to lower the open tone of the string B, he presses his leg against the lever arm 162 thereby causing the piston element 68 to be moved downwardly through the media

of the rods 136 and 80, and the arms 78, 86, 84, and 82. The piston element 68 moves downwardly compressing the spring 100 until the piston element abuts the screw 102, thereby decreasing the tension of the string B the proper amount so that the open string B, when picked, will give the desired lower tone.

It will also be seen that when the steel is disposed on the string B in various positions, the tones resulting when the string is picked will be correspondingly lowered.

When the player releases the pressure of his leg on the lever arm 162, the spring 100 moves the piston element upwardly for increasing the tension of the string B, at which time the string will give a higher tone when picked.

The screw 74 connected with the piston element 68 provides means for properly adjusting the piston element with respect to the string B.

When the player desires to raise the tone of string C, he presses his leg against the lever arm 160 thereby causing the piston element 70 to be moved upwardly through the media of the rods 148 and 130, and the arms 114, 112, 110, and 108. The piston element 70 moves upwardly compressing the spring 130 until the reduced portion 126 of the screw 124 abuts the member 54, thereby increasing the tension of the string C the proper amount so that the open string C, when picked, will give the desired higher tone.

The position of the adjustment screw 124 with respect to piston element 70 determines the distance that the piston element may be moved for exerting the required pressure on the string C.

It will be noted that when the steel is disposed on the string C in the various positions, the tones resulting when the string is picked will be correspondingly raised.

When the player releases the pressure of his leg on the lever arm 160, the spring 130 moves the piston element 70 downwardly until the shoulder 122 of the piston member 70 engages the member 54, thereby decreasing the pressure of piston element 70 against the string C, at which time the open string C produces its normal tone when picked.

Thus it will be seen that by changing the tensions of the strings B and C while the instrument is being played, a greater number of chords may be played when the strings B and C are picked in combination with the other strings, than would otherwise be obtainable.

If so desired the structure may be associated with any of the other strings instead of the strings B and C whereby the tensions thereof may be changed while the instrument is being played.

As shown in Figures 5 and 6 the arms 84 are arranged in pairs, said paired arms being disposed in spaced positions for receiving the piston element 68 and the arms 82 and 86 therebetween. The arms 78 are also paired for receiving the arm 86 therebetween. In like manner the arms 110 and 114 shown in Figure 7 are also arranged in pairs. This arrangement of the arms contributes to the easy operation of the piston elements when the lever arms 160 and 162 are moved.

In Figures 11 to 18 inclusive I have illustrated a modified form of my invention.

This form of my invention comprises a plate member 165 which is connected with the head portion 16 adjacent to the nut 22 and is positioned transversely to the head portion 16 and substantially parallel to the nut 22.

The plate member is provided with openings 166 for receiving screws for being connected with the head portion.

Upwardly extending portions 167 are connected with the plate member and are provided with aligned openings 168 therein for receiving a pair of shafts 169 and 170 which extend through the openings.

Depending arms 171 and 172 are fixedly connected with the shafts 169 and 170 respectively, and have string engaging pins 173 and 174 respectively, connected with the lower ends thereof.

The pins 173 and 174 are positioned below the B and C strings respectively, with which they are in engagement.

A pair of depending actuating arms 175 and 176 are fixedly connected with the shafts 169 and 170 respectively by any suitable means such as nuts 177, which are disposed on threaded ends of the shafts.

Pins 178 are connected with the lower ends of the arms and are connected with each other by a spring 179.

A cam 180 is positioned between the pins 178 so that the edge thereof engages rollers 181 rotatably mounted on the pins 178.

The cam is rotatably mounted on a pin 182 which is connected with a connecting member 183. The connecting member is in turn connected with the plate member 165.

It will be noted at this point that the spring 179 tends to retain the rollers 181 in continuous engagement with the cam.

The cam 180 is provided with an arm portion 184 which is connected with an actuating rod 185 by means of a pin 186. The arm portion 184 is provided with a slotted opening 187 for receiving the pin.

The actuating rod extends beneath the neck 14 of the instrument and is slidably connected therewith by means of fastening elements 188.

The actuating rod 185 is provided with a rod portion 189 which is adjustable with respect thereto and is connected therewith by a connecting element 190. Depending lever arms 191 and 192 are connected with the rod portion 189 and the actuating rod 185 respectively in the same manner as has been already described in connection with lever arms.

When playing the instrument the player holds the instrument in the same manner as has been described heretofore, at which time the player's leg is positioned between the lever arms 191 and 192.

When the player desired to lower the pitch of the B string a half tone, the lever arm 191 is moved to the left as viewed in Figure 12. This movement of the lever arm 191 rotates the cam 180 clockwise as viewed in Figure 16, thereby causing the cam portion 193 to move the actuating arm 175 for rotating the shaft 169. The rotation of the shaft 169 causes the arm 171 to be moved to its dotted line position shown in Figure 18, thereby lessening the tension of string B so that the string will produce a lower tone when picked.

When it is desired to restore the string to its normal tension, the lever arm 192 is moved to the right as viewed in Figure 12, until the cam is disposed in its normal position, in which position it is shown in Figure 16.

When the player desires to increase the tension of string C so that the string will produce a higher tone when picked, he moves the lever

arm to the left in Figure 12 thereby rotating the cam counterclockwise.

The counterclockwise rotation of the cam causes the roller 181 connected with the actuating arm 176 to move along the face 194 of the cam, thereby moving the actuating arm 176 for rotating the shaft 170.

The rotation of the shaft 170 causes the arm 172 to be moved to its dotted line position shown in Figure 17, thereby increasing the tension of string C so that the string will produce a higher tone when picked.

When the player desires to lower the tone of string C again he moves the lever arm 191 to the left in Figure 12 until the cam 180 assumes its normal position.

It will be noted that the cam is provided with shoulders 195 which engage the rollers 181 for limiting the rotation of the cam.

While I have illustrated and described a certain embodiment of my invention, it will be readily understood that certain modifications and changes may be made without departing from the spirit or scope of the invention.

I claim:

1. A device adapted to be attached to a guitar for varying the tone of a string thereof comprising a support adapted to be secured to the lower side of the neck of the guitar, a reciprocatory member carried by said support and adapted to extend through the neck into contact with said string, and leg operable means for actuating said member vertically for varying the tension of said string during the playing of the guitar.

2. A device adapted to be attached to a guitar for varying the tone of a string thereof comprising a support adapted to be secured to the neck of the guitar, a reciprocatory member carried by said support and adapted to extend vertically through said neck into contact with said string, a system of links connected to said member, and horizontally movable leg operable means attached to said link system for effecting the vertical actuation of said reciprocal member for varying the tension of said string during the playing of the guitar.

3. A device adapted to be attached to a stringed instrument for varying the tone of a string thereof comprising a support adapted to be secured to the instrument, a reciprocatory member adapted to contact with said string, leg operable means for actuating said member, and axially adjustable means carried by said reciprocatory member for varying the effective length thereof.

4. A device adapted to be attached to a stringed instrument for varying the tone of a string thereof comprising a support adapted to be secured to the instrument, a reciprocatory member adapted to contact with said string, leg operable means for actuating said member, and axially adjustable means carried by said reciprocatory member for varying the effective length thereof, said adjustable means comprising a string engaging member threadedly engaging said reciprocatory member.

5. A device adapted to be attached to a stringed instrument for varying the tone of a string thereof comprising a support adapted to be secured to the instrument, a reciprocatory member adapted to contact with said string, leg operable means for actuating said member, and axially adjustable means carried by said reciprocatory member for varying the effective length thereof, said adjustable means comprising a string engaging member threadedly engaging said reciproca-

tory member, and having a string receiving slot in the upper end thereof.

6. A device adapted to be attached to a stringed musical instrument for varying the tone of a string thereof comprising a support, a reciprocatory member carried thereby and extending through opposite sides thereof, one end of said member being provided with a string engaging recess, the opposite end of said member being provided with a stop for limiting the axial movement of said member in one direction, and leg operable means for actuating said member.

7. A device adapted to be attached to a stringed musical instrument for varying the tone of a string thereof comprising a support, a reciprocatory member carried thereby and extending through opposite sides thereof, one end of said member being provided with a string engaging recess, the opposite end of said member being provided with an axially adjustable stop for limiting the movement of said member in one direction, and leg operable means for actuating said member.

8. A device adapted to be attached to a stringed musical instrument for varying the tone of a string thereof comprising a support, a reciprocatory member carried thereby and extending through opposite sides thereof, a substantially vertical tube carried by said support for guiding said member, an adjustable member in the upper end of said reciprocatory member provided with a slot for receiving said string, a substantially horizontally movable leg operable member, and a plurality of links operatively connected to said leg operable member and said reciprocatory member for translating horizontal movement of the former into vertical movement of the latter.

9. A device adapted to be attached to the lower side of the neck of a stringed musical instrument for varying the tone of two strings thereof comprising a supporting member, a pair of substantially vertical sleeves carried thereby and adapted to project through said neck in alignment with said two strings, a reciprocatory member in each sleeve having an adjustable string contacting element at the upper end thereof, a spring encircling each of said members, one of said springs urging the respective member upwardly to increase the tension of the string contacting with the same and the other spring urging said other member downwardly to lessen the tension of the respective string, a pair of substantially horizontal operating members supported by the lower portion of said neck, and a system of links connecting each of said operating members to one of said reciprocatory members for translating horizontal movement of the former into vertical movement of the latter against the action of the respective springs thereof.

10. A device adapted to be attached to the lower side of the neck of a stringed musical instrument for varying the tone of two strings thereof comprising a supporting member, a pair of substantially vertical sleeves carried thereby and adapted to project through said neck in alignment with said two strings, a reciprocatory member in each sleeve having an adjustable string contacting ele-

ment at the upper end thereof, a spring encircling each of said members, one of said springs urging the respective member upwardly to increase the tension of the string contacting with the same and the other spring urging said other member downwardly to lessen the tension of the respective string, a pair of substantially horizontal operating members supported by the lower portion of said neck, and a system of links connecting each of said operating members to one of said reciprocatory members for translating horizontal movement of the former into vertical movement of the latter against the action of the respective springs thereof, said operating members being provided with spaced depending leg engaging members.

11. A device adapted to be attached to the lower side of the neck of a stringed musical instrument for varying the tone of two strings thereof comprising a supporting member, a pair of substantially vertical sleeves carried thereby and adapted to project through said neck in alignment with said two strings, a reciprocatory member in each sleeve having an adjustable string contacting element at the upper end thereof, a spring encircling each of said members, one of said springs urging the respective member upwardly to increase the tension of the string contacting with the same and the other spring urging said other member downwardly to lessen the tension of the respective string, a pair of substantially horizontal operating members supported by the lower portion of said neck, and a system of links connecting each of said operating members to one of said reciprocatory members for translating horizontal movement of the former into vertical movement of the latter against the action of the respective springs thereof, said operating members being provided with spaced depending leg engaging members, one of said operating members being adjustable longitudinally for varying the spacing of said depending members.

12. A device adapted to be attached to the lower side of the neck of a stringed musical instrument for varying the tone of two strings thereof comprising a supporting member, a pair of substantially vertical sleeves carried thereby and adapted to project through said neck in alignment with said two strings, a reciprocatory member in each sleeve having an adjustable string contacting element at the upper end thereof, a spring encircling each of said members, one of said springs urging the respective member upwardly to increase the tension of the string contacting with the same and the other spring urging said other member downwardly to lessen the tension of the respective string, a pair of substantially horizontal operating members supported by the lower portion of said neck, and a system of links connecting each of said operating members to one of said reciprocatory members for translating horizontal movement of the former into vertical movement of the latter against the action of the respective springs thereof, said operating members being provided with spaced depending leg engaging members hinged thereto.

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