Sept. 15, 1931. C. B. GARDNER, JR 1,823,683

TONE MODIFYING DEVICE FOR THE VIBRATING ELEMENTS OF MUSICAL INSTRUMENTS

Filed Nov. 30, 1928 2 Sheets-Sheet 1

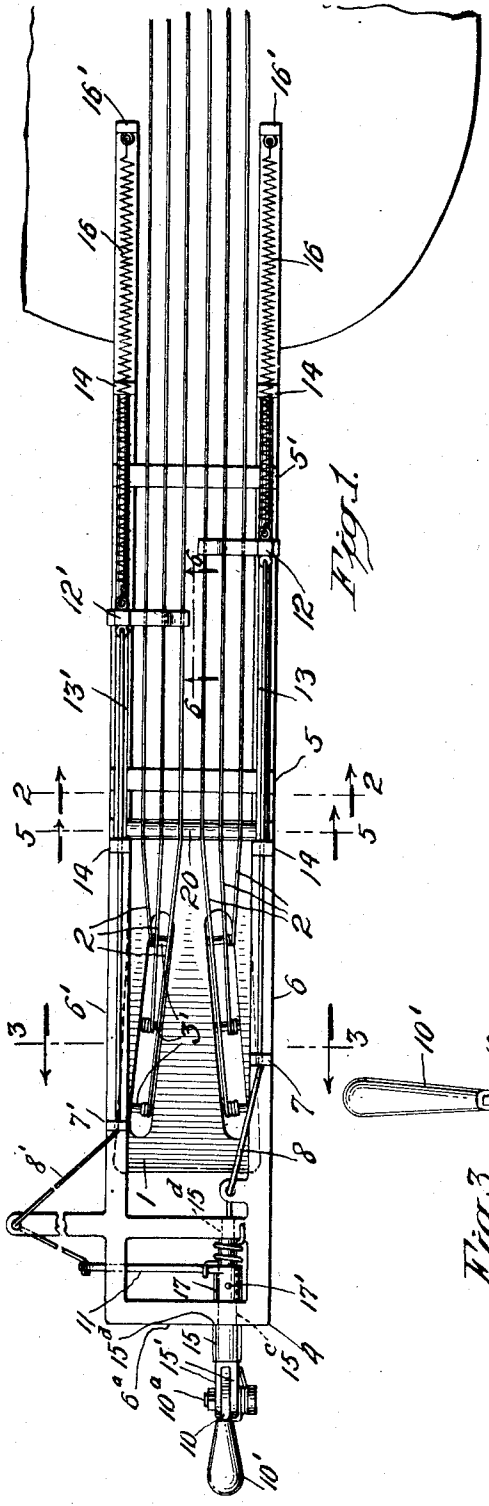


Fig. 1.

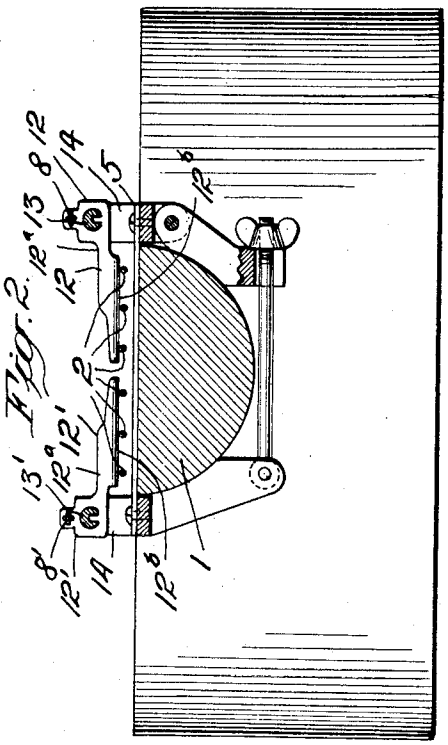


Fig. 2.

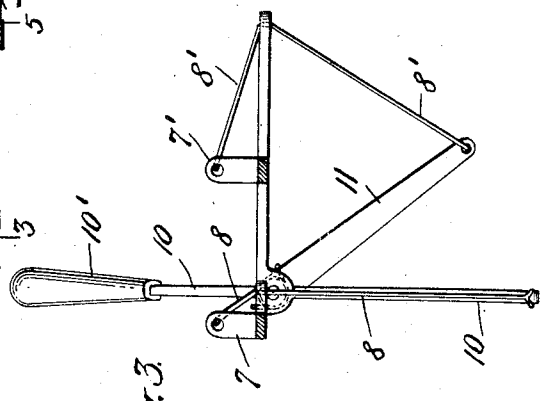


Fig. 3.

INVENTOR
Charles B. Gardner Jr.
BY
Joseph T. O'Brien
His ATTORNEY

Sept. 15, 1931. C. B. GARDNER, JR 1,823,683

TONE MODIFYING DEVICE FOR THE VIBRATING ELEMENTS OF MUSICAL INSTRUMENTS

Filed Nov. 30, 1928 2 Sheets-Sheet 2

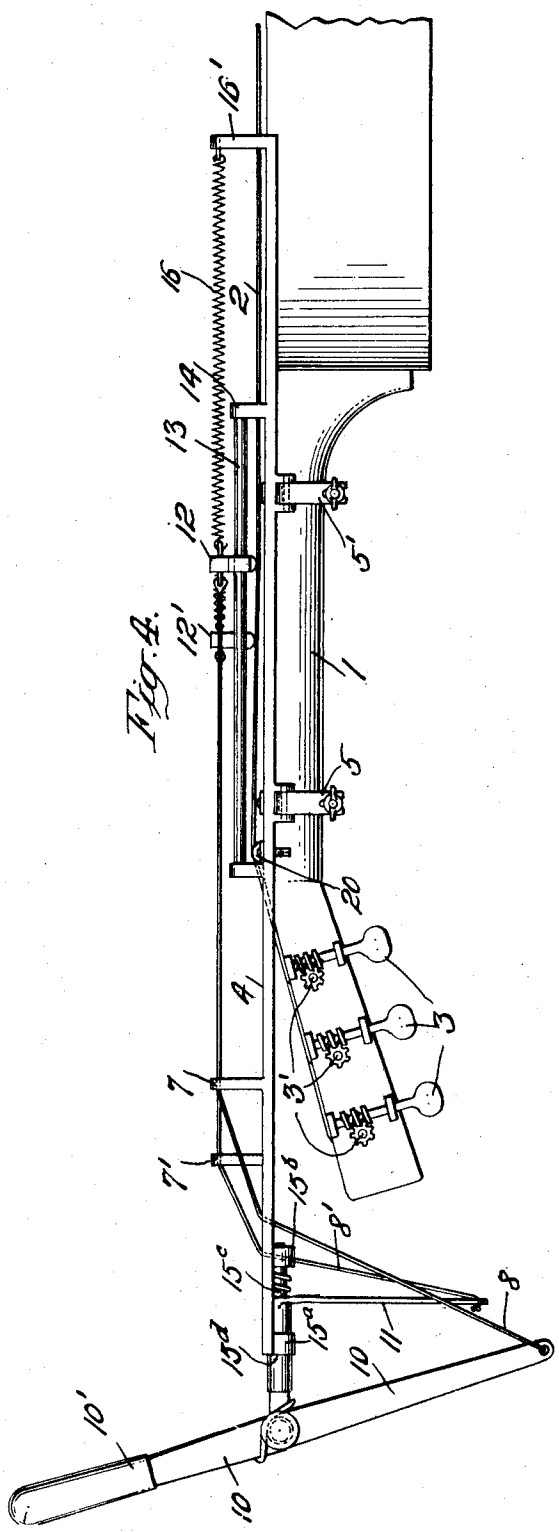


Fig. 4.

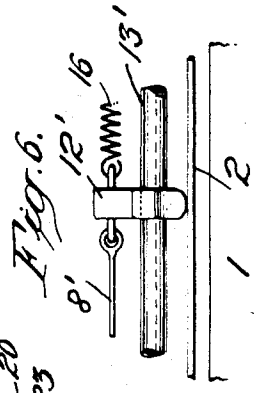


Fig. 6.

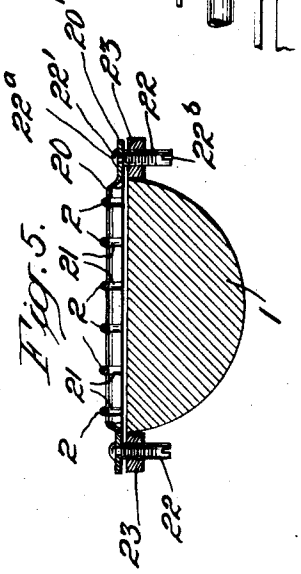


Fig. 5.

INVENTOR
Charles B. Gardner Jr.
BY Joseph F. O'Brien
His ATTORNEY

Patented Sept. 15, 1931

1,823,683

UNITED STATES PATENT OFFICE

CHARLES B. GARDNER, JR., OF LONG BEACH, CALIFORNIA

TONE MODIFYING DEVICE FOR THE VIBRATING ELEMENTS OF MUSICAL INSTRUMENTS

Application filed November 30, 1928. Serial No. 322,673.

This invention relates to improvements in tone-modifying devices for the vibrating elements of musical instruments.

One of the objects of this invention is to produce, in combination with a musical instrument having a plurality of sound-producing vibrating elements, a plurality of movable devices for producing a relative modification of the tones of such vibrating elements, and means for moving such tone-modifying devices relatively while playing the instrument.

Another object of the invention is to provide in a stringed instrument, preferably having a fretted finger board and a plurality of sound-producing strings mounted thereon, a plurality of movable devices for fretting said strings relatively while playing the instrument.

Another object of this invention is to provide, in a device of the character specified, a plurality of controlling members for moving the string-fretting devices, and a common operating handle for operating said controlling members to move said string-fretting devices.

More particularly my invention comprises the combination with a musical instrument having a finger board and a plurality of sound-producing strings mounted thereon, of an attachment embodying a plurality of tone-modifying devices having relative movement and each movable to engage and fret a string or strings at varying positions to cause relative modification of the pitches thereof. These tone-modifying elements have connected thereto and stretched to a fixed part at one side thereof, primary springs tending to initially force the same to starting position, additional balancing springs being so connected in the mechanism as to apply pressure, tending to move said devices in the opposite direction and to balance the pressure of the primary springs above described.

Furthermore, said tone-modifying devices are preferably moved by controlling members movable in diverse directions and connected thereto, preferably by flexible connections, which controlling members are in turn preferably actuated by a single operating element. Said controlling members preferably comprise lever arms connected, as aforesaid, to said tone-modifying elements and the operating element may comprise the handle of one of said levers.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and cooperate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:—

Fig. 1 is a plan view of the neck of a guitar having mounted thereon a device embodying my invention;

Fig. 2 is a section on the line 2—2 of Fig. 1, looking in the direction of the arrow;

Fig. 3 is a section on the line 3—3 of Fig. 1, looking in the direction of the arrow;

Fig. 4 is a side elevation of the device illustrated in Figs. 1 to 3 inclusive;

Fig. 5 is a section on the line 5—5 of Fig. 1, looking in the direction of the arrow; and

Fig. 6 is a fragmentary section on the line 6—6 of Fig. 1, looking in the direction of the arrow.

Referring now to these drawings, which embody a preferred form of my invention as applied to an attachment for relatively fretting a plurality of strings, 1 indicates the neck of a guitar or other stringed musical instrument on which a series of strings 2 are mounted, passing around tuning shafts 3′ and tuned by conventional tuning finger pieces 3, in the ordinary way.

In accordance with my invention, I mount on the neck 1 of the instrument an attachment 4 which is clamped to the neck by clamps 5, 5′. It will be understood that I provide a supporting structure indicated as a whole by the reference numeral 4. This preferably comprises supporting side strips 6, 6′ connected at one end by a web member 6^a and clamped to the neck of the instrument by the clamps 5, 5′. The supporting strips 6, 6′ are provided with elevated

supporting and guiding bridges 7, 7′ for a plurality of cables 8, 8′ respectively, the cable 8 being connected to the lower end of a lever arm 10 and the cable 8′ to the lower end of a lever arm 11 which are preferably pivotally mounted on the support or attachment 4 at the outer end thereof. The opposite ends of the cables 8 and 8′ are connected to tone-modifying or pitch-varying elements preferably comprising slides 12, 12′ guided upon rods 13, 13′ mounted at opposite ends in supporting brackets 14, and adapted to vary the effective length of the string by engagement therewith at varying positions along the neck of the guitar.

In the embodiment shown, the slides 12, 12′ are provided with contact arms 12^a each having a foot 12^b arranged to contact with three strings and to fret the same upon the sliding of the slides 12, 12′. The slides 12, 12′ are maintained in their starting or initial position by means of coil springs 16 connected at one of their ends to the slides and at the other ends to supporting posts 16′ suitably mounted on the attachment or on the body or neck 1 of the guitar.

In the preferred form of my invention illustrated, the lever arm 10 is pivotally mounted on a pivot pin or rock-shaft 10^a mounted in a forked bearing 15′ formed integrally at one end of a rock-shaft 15 disposed at a right angle to the pivot pin or rock-shaft 10^a and having at its opposite end a reduced portion 15^c bearing in bearing brackets 15^a, 15^b fixedly mounted on the underside of the supporting attachment 4. The shoulder 15^d between the reduced portion 15^c and the body 15 forms a limiting stop to prevent inward movement of said shaft 15. The reduced portion of said shaft between the bearings 15^a and 15^b, has mounted thereon and fastened thereto by a pin 17′, a sleeve 17 which locks the shaft in place and also carries the lever arm 11 which, as shown, is formed integral therewith.

The lever 10 is preferably provided above its pivot with a handle 10′ by which, it will be understood, the two levers may be operated to cause relative movement of the slides. Thus, the handle 10′ may be swung axially or longitudinally in opposite directions to rock the controlling lever 10 about its pivot 10^a and this movement will cause a sliding movement of the slide 12. This sliding movement of the slide 12 may, if desired, be accomplished without in any way moving or disturbing the slide-controlling lever 11. If now it is desired to move the slide 12′ only, the handle 10′ is swung substantially at a right angle to the actuating movement for independently moving the other slide 12, this movement rocking the lever 11 and shaft 15 without effecting an operating movement of the lever 10. It will be understood, however, that the slides may be moved simultaneously in both directions or the two slide members may be moved in opposite directions, and these movements may be accomplished by a swinging of the handle to positions in between the rectangular positions hereinabove described.

It is desirable, in a device of the character specified, to elevate the strings of the musical instrument into a position somewhat above the normal playing position thereof and for this purpose I provide an adjustable nut 20 which, as shown, is formed of metal provided with the usual string grooves 21 and has fastened thereto, at opposite ends, adjusting screws 22 which are threaded into tapped holes 23 in the side strips 6, 6′. As illustrated, each of the adjusting screws 22 are reduced at 22′, passed through a hole in a flattened portion 20′ of the nut and the upper end of the screw is flattened to form a rivet-head 22^a. The opposite end of the adjusting screw 22 is provided with a kerf 22^b for the insertion of a screw driver to permit an adjusting movement of the screw. Obviously, the turning of these screws will move the nut upwardly and elevate the strings to any desired position. It will be understood that, by the use of the aforesaid mechanism, the tones of the strings may, in playing, be varied to produce many novel effects.

Having described my invention, I claim:—

1. A tone-modifying device embodying, in combination, a suitable support, a plurality of sound-producing vibrating elements mounted on said support, a plurality of elements movable relatively along said vibrating elements, and means for operating such elements to produce relative modification of the tones thereof during playing of the instrument.

2. A tone-modifying device embodying, in combination, a suitable support, a plurality of sound-producing vibrating elements mounted on said support, a plurality of elements movable relatively along said vibrating elements for producing relative modification of the tones thereof, and a single operating element operatively connected to said relatively movable tone-modifying elements.

3. In a musical instrument having a finger board, a plurality of sound-producing strings mounted on said finger board, a plurality of tone-modifying elements movable relatively and operative to engage and fret said strings to cause a relative modification of the pitches of said strings, and a single operating element operatively connected with said fretting elements.

4. A tone-modifying device embodying, in combination, a suitable support, a plurality of sound-producing vibrating elements mounted on said support, a plurality of elements movable relatively along said vibrat-

ing elements for producing relative modification of the tones thereof, a plurality of lever arms also mounted on said support, operative connections between said levers and said tone-modifying elements, and a single operating element operable to move said levers to cause relative movement of said tone-modifying elements.

5. A tone-modifying device embodying, in combination, a suitable support, a plurality of sound-producing vibrating elements mounted on said support, a plurality of elements movable relatively along said vibrating elements for producing relative modification of the tones thereof, a plurality of lever arms also mounted on said support, flexible connections operatively connected between said levers and said tone-modifying elements, and a single operating element operable to move said levers to cause relative movement of said tone-modifying elements.

6. In a musical instrument having a finger board, a plurality of sound-producing strings mounted on said finger board, a plurality of tone-modifying elements movable relatively and operative to engage and fret said strings to cause a relative modification of the pitches of said strings, springs connected with said tone-modifying elements for normally moving them to initial or starting position, spring means for balancing the last-mentioned springs, and a single manually-actuated operating element connected with said tone-modifying element.

In witness whereof, I have signed my name to the foregoing specification.

CHARLES B. GARDNER, JR.