

Jan. 24, 1933.

R. M. SULLIVAN.

1,895,383

STRINGED MUSICAL INSTRUMENT

Filed May 4, 1932

4 Sheets-Sheet 1

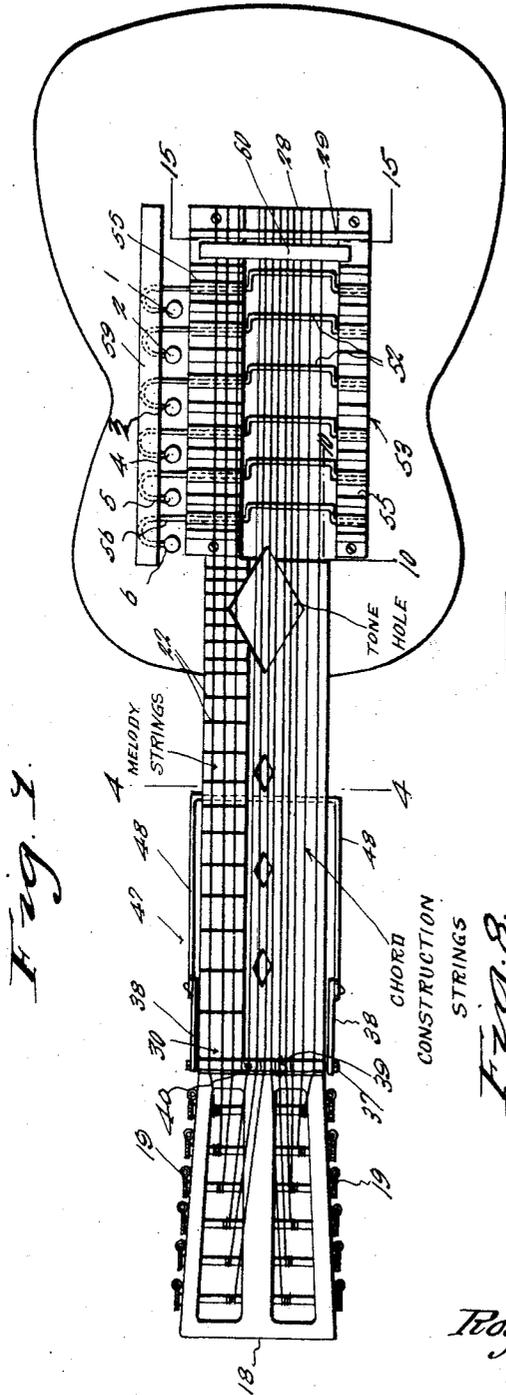


Fig. 2.

Fig. 9.

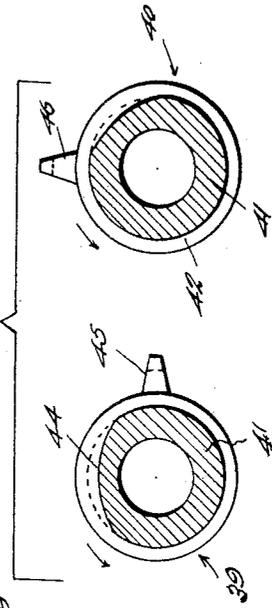
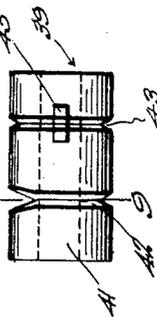


Fig. 8.



CONSTRUCTION STRINGS

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4 Sheets-Sheet 2

Fig. 2.

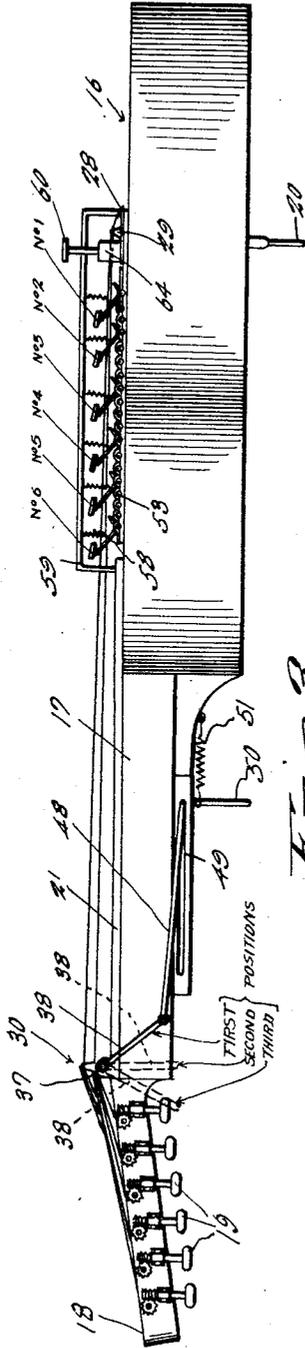


Fig. 3.

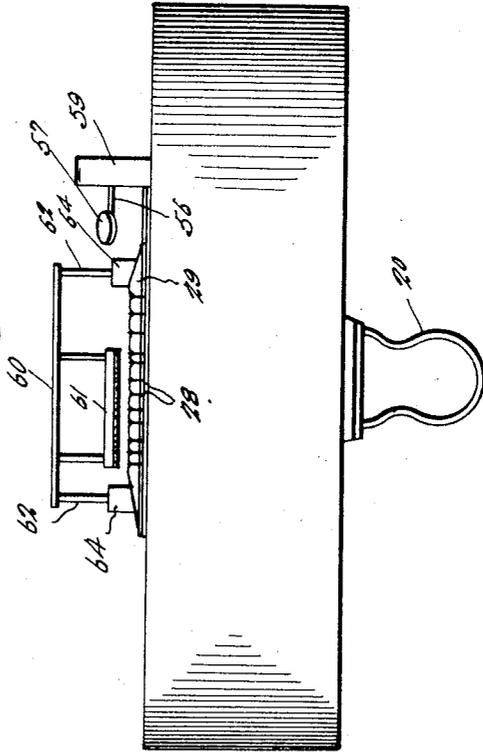
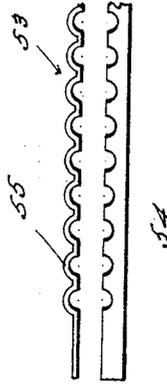


Fig. 14.



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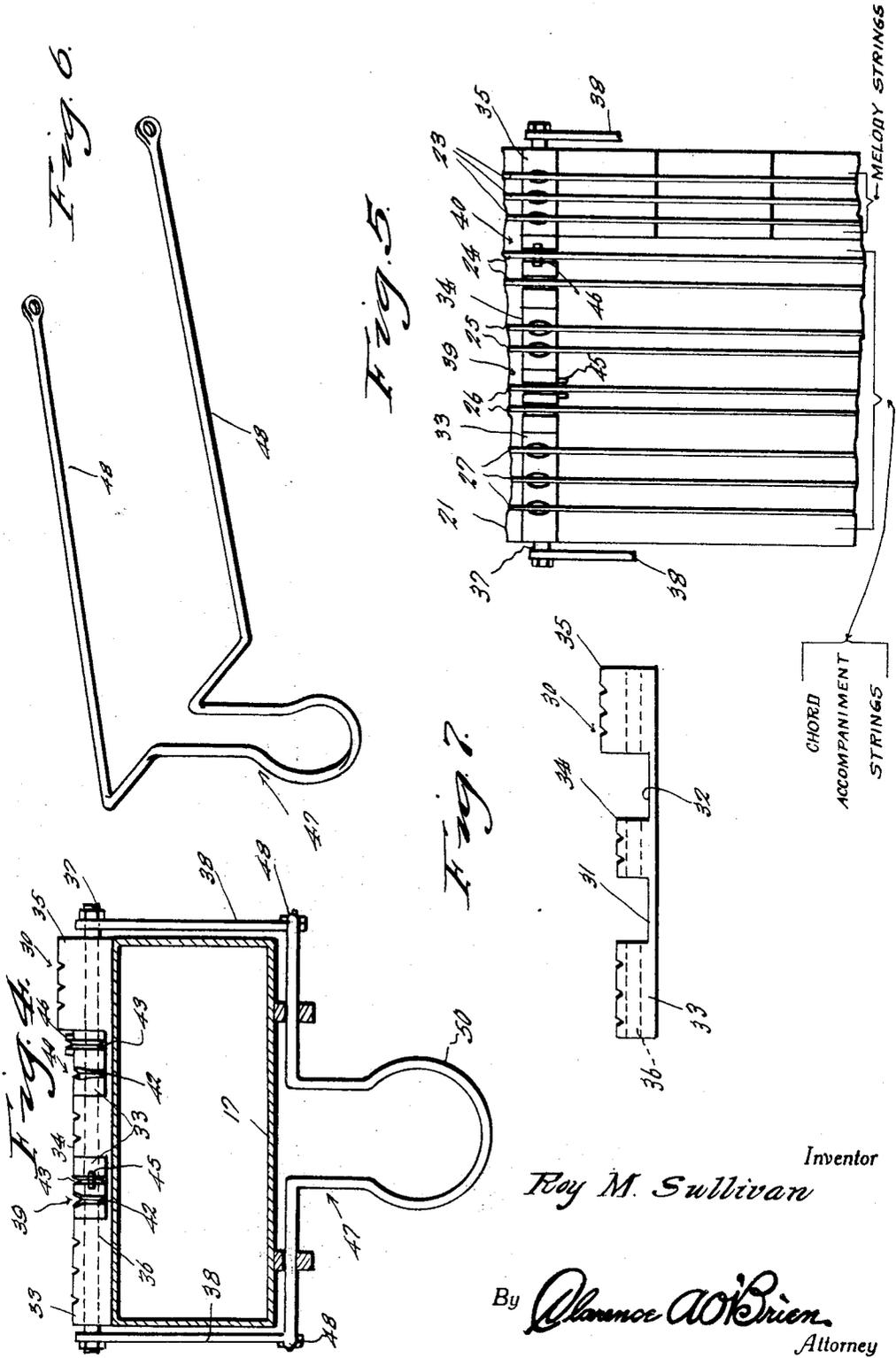
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4 Sheets-Sheet 3



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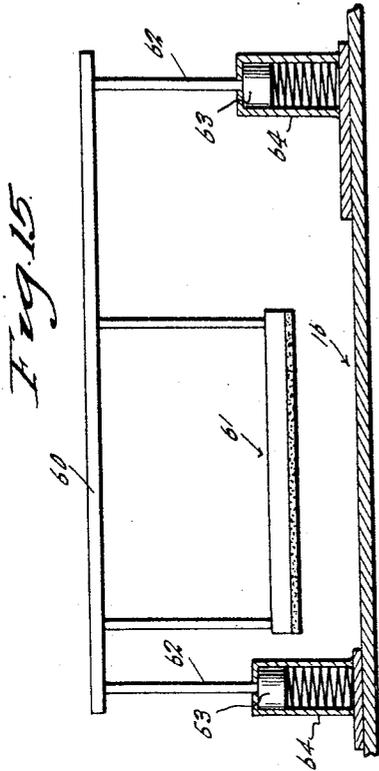


Fig. 15.

Fig. 16.

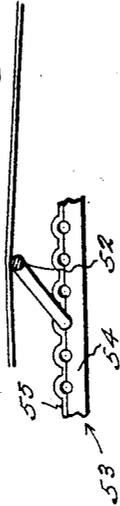


Fig. 13.

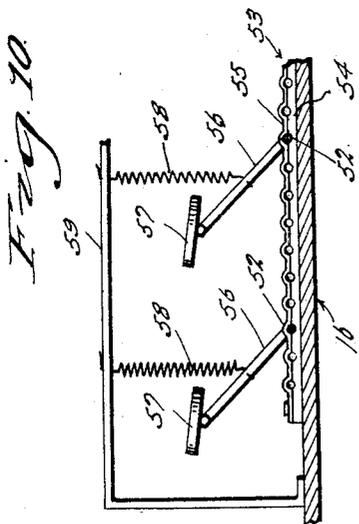
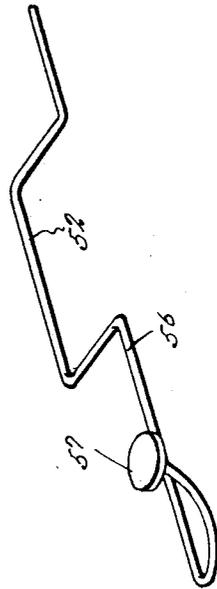
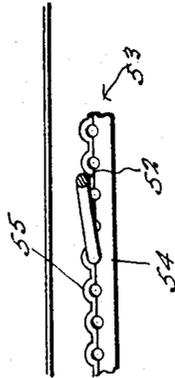


Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE

ROY M. SULLIVAN, OF ATLANTA, GEORGIA, ASSIGNOR OF ONE-HALF TO HORACE W. SULLIVAN, OF ATLANTA, GEORGIA

STRINGED MUSICAL INSTRUMENT

Application filed May 4, 1932. Serial No. 609,202.

This invention relates to an improved stringed musical instrument in the nature of a guitar having the ability to afford the combined results of two guitars, that is, capable of producing harmonious melody and chord accompaniment in unison.

More explicitly described, I have evolved and produced a practical dual guitar including two distinguishable sets of strings, one set being played like a Hawaiian steel guitar and the other set of strings serving to produce the supporting accompaniment chords, whereby through the use of proper plectrum effects the melody and chords may be sounded in unison.

One structural feature of the ensemble is the provision of manually manipulated finger mechanism playable by the right hand for developing the requisite chord effects in proper order and progression.

Another dominant structural feature is predicated upon the use of mechanical means actuated by the left knee of the performer for raising and lowering the pitch of the chord strings in a substantially automatic manner so as to permit the performer to expeditiously make a full range of chords, such as for example, major, minor seventh and diminished chords.

Other features and advantages of the arrangement will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a plan view of the complete instrument as constructed in accordance with the present inventive conception.

Figure 2 is a side or edge elevational view thereof.

Figure 3 is an end view showing the butt end of the instrument.

Figure 4 is an enlarged transverse section taken on the plane of the line 4-4 of Figure 1.

Figure 5 is a fragmentary plan view showing the distinguishable sets of melody and chord strings respectively.

Figure 6 is a perspective view of the knee slide.

Figure 7 is a detail view of the relatively fixed part of the bridge.

Figure 8 is a detail view of one of the relatively movable sections of said bridge.

Figure 9 is a group view of the two movable sections of said bridge showing them in their normal relative relationships.

Figure 10 is a detail view showing the spring suspended arrangement of the finger depressed keys.

Figure 11 is a view detailing one of the movable frets or string stop devices in its lowered inactive position.

Figure 12 is a view like Figure 11 showing the device elevated into contact with the strings for shortening the effective vibratory length thereof.

Figure 13 is a perspective view of one of the stop devices per se.

Figure 14 is a view showing the adjustable mounting for the plurality of stop devices.

Figure 15 is a view in section and elevation showing a permanently attached damper or tone mute.

Referring now to the drawings in detail and utilizing the same reference characters to designate like parts throughout the views, it will be observed that the numeral 16 designates the hollow body of the instrument. This has conventional shape such as is utilized in the construction of an ordinary Hawaiian steel guitar.

The neck, which may be hollow, is designated by the numeral 17 and terminates at the left end in a head 18 constructed to accommodate the conventional tuning devices 19. In playing position, the body is placed on the lap of the performer and in order that it may be conveniently held in a stationary position it is provided with a depending bracket 20 of the shape seen in Figure 3 which serves as an abutment against which the right leg is pressed.

The finger board is denoted by the numeral 21 and approximately one-third thereof is provided with longitudinally spaced frets 22. The remainder is plain and smooth and not designed for the usual fingering purposes. In fact, instead of using the fingers for mak-

ing chords I use a mechanical key controlled mechanism.

Before describing this mechanism however, I want to call attention to the fact that there are twelve strings. The group of three strings which overlie the fretted part of the fingerboard serve as the melody strings and are distinguished in Figure 5 by the numeral 23. The remaining group of nine strings which are distinguished as chord accompaniment strings are actually divided into four sets denoted by the numerals 24, 25, 26 and 27 respectively. The strings are of course of appropriate gauge dependent on the system of tuning utilized by the performer.

All strings are permanently anchored at the right hand end as indicated at the point 28 in Figure 2 and at this point they pass over the primary fixed bridge 29. The opposite ends of the string are seated in retaining notches in the secondary bridge generally denoted by the numeral 30. This last-named bridge which occupies the position of the ordinary nut on the instrument is of composite construction, and the ends of the strings passing over this are attached to the usual tuning devices 19 as is customary.

The bridge 30 is made up of three distinguishable sections or units. For example, the stationary unit seen in Figure 7 comprises a cross bar having spaced notches 31 and 32 defining three differentiated risers 33, 34, and 35 respectively. The riser 35 is disposed on a plane above the companion members 33 and 34, and is provided with three notches to accommodate the strings 23. The intermediate one 34 serves to accommodate the strings 25 and the remaining one 33 serves to accommodate the strings 27 as seen in Figure 5.

The numeral 36 designates a longitudinal bore through these three parts which serves as a bearing for an oscillatory rocker shaft 37 having fixed rocker arms 38 at opposite ends.

Under this arrangement it is obvious that the strings 23 for melody purposes are elevated above the remaining chord strings so as to facilitate playing with the customary sliding steel. The strings 24 and 26 co-operate with relatively movable sleeve-like units distinguished by the numerals 39 and 40 respectively, these units being keyed on the rocker shaft and movable therewith for progressively elevating the associated strings for raising and lowering the pitch in a substantially automatic manner.

Each of the units 39 and 40 comprises a sleeve 41 and each one is formed with a pair of grooves 42 and 43, the grooves 42 being deepened as indicated at the points 44 in Figure 9. The sleeve 39 has a notched lifting finger 45 in alinement with the groove 43 and the sleeve 40 has a similar notched string lifting finger 46 and these fingers

occupy the normal alternately operable relationship seen in Figure 9.

I now call attention to the operating means for the movable unit of the bridge which comprises a slide 47 of the type shown in Figure 6. This includes a pair of spaced parallel arms 48 slidably mounted in slots in a supporting bracket 49 on the underside of the neck as seen in Figure 2. The device also includes a depending abutment 50 and a return spring 51. The abutment is so located as to permit it to be shifted forwardly or outwardly by pressure from the left knee. The arms 48 are pivotally attached to the rocker arms or crank arms 38 and these crank arms have three definite positions referred to as "first", "second" "third".

The "first" position is the normal position wherein the units 39 and 40 do not affect the pitch of the complemental strings. The "second" and "third" positions however bring the lifting fingers 45 and 46 successively into play for impinging against the complemental strings to such an extent as to vary the pitch for the making of different types of chords.

I provide six distinguishable chord producing devices or adjustable frets for co-operation with the right hand ends of the chord construction string as seen in Figure 1. Each device is the same in construction and a description of one will suffice for all. The device is in the nature of a crank 52 as seen in Figure 13 and this is adjustably and rockably mounted in bearing fixtures 53.

Each fixture comprises a base member 54 and a top member 55, these being constructed to permit the various devices to be shifted longitudinally for changing the range of the tone. Moreover each device has the end portion 56 constructed to accommodate a finger depressed key 57. As before stated, there are six of these keys and they are numbered from one to six inclusively in Figure 2. The numerals 58 designate return springs anchored on a suitable hanger bracket 59 as seen in Figure 10.

The cranks drop down by gravity but are lifted up by pressure of the finger on any selected one of the keys, and the crank simultaneously bridges all of the overlying strings to act as a fret for varying the effective vibratory length of the strings in unison to produce the chord effect.

These six keys are operable by the third and fourth fingers of the right hand. The three melody strings are plucked by the first and second fingers of the same hand and the thumb of the same hand is used for strumming the chord strings as the chords are mechanically changed from major to minor, seventh and diminished, according to the composition.

The following operation of the buttons or keys in order given will clarify just how the various types or kinds of chords are made:

When pressing button No. 1 down with crank 37 in first position No. 1 chord is B flat major with B flat bass next. No. 2 chord is F 7th chord with C natural and F natural basses.

When crank is in second position No. 1 chord is B flat minor with B flat bass. No. 2 chord is F major chord with C natural and F natural basses.

When crank is in the third position No. 1 chord is B flat 7th chord with B flat bass, and No. 2 chord is F minor chord with A natural and F natural basses.

"Button No. 2"

When pressing button No. 2 with cranks in first position chord No. 1 is B major chord with B bass, and chord No. 2 is F sharp 7th chord with C sharp and F sharp basses.

When crank is in second position chord No. 1 is B minor chord with B bass and chord No. 2 is F sharp major chord with C sharp and F sharp basses.

When crank is in its third position No. 1 chord is B 7th chord with B bass and chord No. 2 is F sharp minor chord with C sharp and F sharp basses.

"Button No. 3"

When pressing button No. 3 with cranks on first position No. 1 chord is C major chord with C bass. No. 2 chord is G 7th chord with D and G basses.

When the crank is on second position No. 1 chord is C minor chord with C bass and No. 2 is G major chord with D and G basses.

When crank is on third position No. 1 chord is C 7th chord with C bass and No. 2 chord is C minor chord with D and G basses.

"Button No. 4"

When pressing down button No. 4 with crank on first position chord No. 1 is D flat major with D flat bass and chord No. 2 is A flat 7th with E flat and A flat basses.

When crank is on second position No. 1 chord is D flat minor chord with D flat bass, and chord No. 2 is A flat major chord with E flat and A flat basses.

When crank is on third position No. 1 chord is D flat 7th chord with D flat bass and chord No. 2 is A flat minor chord with E flat and A flat basses.

"Button No. 5"

When pressing button No. 5 and crank on first position chord No. 1 is D major chord with D bass and chord No. 2 is A 7th with E and A basses.

When crank is on second position No. 1 chord is D minor chord with D bass and chord No. 2 is A major chord with E and A basses.

When crank is on third position No. 1 chord is D 7th chord with D bass and chord

No. 2 is A minor chord with E and A basses.

"Button No. 6"

When pressing down button No. 6 and crank on first position No. 1 chord is E flat major with E flat bass. Chord No. 2 is B flat 7th and F, natural and B flat basses.

When crank is on second position No. 1 chord is E flat minor chord with E flat bass, and chord No. 2 is B flat major chord with F natural and B flat basses.

When crank is on third position No. 1 chord is E flat 7th chord with E flat bass, and chord No. 2 is B flat minor chord with F natural and B flat basses.

All diminished chords can be made by pressing two buttons in succession and these diminished chords can be made in twelve different positions.

In a musical instrument constructed in accordance with the principles of this invention will be found satisfactory in playing all varieties of musical compositions and desirable because of the harmonious lead and accompaniment effect.

In Figure 15 the numeral 60 designates a bar carrying a self-faced damper or muting device 61 used for damping the tone of the string. The bar carries depending arms 62 having heads 63 slidably mounted in spring-contained cylinders 64 which serves to return the bar to its normal elevated position. The bar is operated by the wrist of the right hand.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

1. A musical instrument of the class described comprising a body having a headed neck, and twelve individual strings attached to the body and neck and strung in a manner to provide a distinct group limited to three strings for playing the lead or melody, and a second group made up of nine co-ordinated strings for playing chord accompaniment to said melody.

2. A musical instrument of the class described comprising a body having a headed neck, twelve separate strings attached to the body and neck and strung in a manner to provide a primary group limited to three companion strings for playing the lead or melody, and a second group comprising nine co-ordinated strings for playing chord accompaniments, and finger depressed mechanism for mechanically fretting said chord accompaniment strings, said mechanism be-

ing located on the body for convenient manipulation by the fingers of the right hand.

3. A musical instrument of the class described comprising a guitar including a body
 5 having a neck and a head at one end of said neck, string tuning devices carried by said head, said neck including a fingerboard and said fingerboard having a limited portion fretted and the remaining portion smooth
 10 and without frets, a group of three melody strings overlying the fretted portion of the fingerboard and anchored at one end on the body and at the opposite end to the tuning devices and adapted to be played with a Hawaiian guitar steel slide for producing the
 15 desired melody, a plurality of chord construction strings overlying the smooth fretless portion of the fingerboard, the last-named strings being anchored at one end on the
 20 body and attached at their opposite ends to said tuning devices, and finger depressed mechanism for said chord construction strings supported on the body and including a plurality of keys operable by the fingers
 25 of the right hand, and crank-like frets underlying and co-operable with said chord construction strings.

4. In a duplex guitar of the class described, a body of conventional shape, a neck attached to said body and formed at its left
 30 hand end with a head provided with ordinary string attaching and tuning devices, said neck having a fingerboard with a restricted portion provided with frets and the remaining portion smooth and without frets,
 35 a group of three melody strings strung over the fretted part of the fingerboard and anchored on the body and tuning devices, a group of additional strings strung over the
 40 unfretted part of the fingerboard, the second group of strings being disposed on a plane below the first-named strings and being adapted for playing of accompaniment chords, bearing fixtures attached to the body
 45 near the right hand ends of the strings, a plurality of longitudinally spaced cranks adjustably and rockably mounted in said bearing fixtures and provided with individual finger depressible keys, the cranks serving
 50 as frets and being movable into contact with the undersides of said additional strings to serve as selectively usable frets or stop devices.

5. In a duplex guitar of the class described,
 55 a body of conventional shape, a neck attached to said body and formed at its left-hand end with a head provided with ordinary string attaching and tuning devices, said neck having a fingerboard with a restricted portion provided with frets and the
 60 remaining portion smooth and without frets, a group of three melody strings strung over the fretted part of the fingerboard and anchored on the body and tuning devices, a
 65 group of additional strings strung over the

unfretted part of the fingerboard, the second group of strings being disposed on a plane below the first-named strings and being adapted for playing of accompaniment
 70 chords, bearing fixtures attached to the body near the right hand ends of the strings, a plurality of longitudinally spaced cranks adjustably and rockably mounted in the bearing fixtures and provided with individual finger
 75 depressible keys, the cranks serving as frets and being movable into contact with the undersides of the overlying strings of said additional group to serve as selectively usable frets or stop devices, and the end of the neck
 80 adjacent said head being provided with a bridge including stationary members and movable members, the movable members having elements co-operable with predetermined strings of said additional group for raising
 85 and lowering the pitch of said strings while the instrument is being played, and mechanical means for actuating said movable members.

6. In a duplex guitar of the class described, a body of conventional shape, a neck attached to said body and formed at its left
 90 hand end with a head provided with ordinary string attaching and tuning devices, said neck having a fingerboard with a restricted portion provided with frets and the remaining
 95 portion smooth and without frets, a group of three melody strings strung over the fretted part of the fingerboard and anchored on the body and tuning devices, a group of additional strings strung over the unfretted part of the
 100 fingerboard, the second group of strings being disposed on a plane below the first-named melody strings and being adapted for playing of accompaniment chords, bearing fixtures attached to the body near the right hand ends
 105 of the strings, a plurality of longitudinally spaced cranks adjustably and rockably mounted in said bearing fixtures and provided with individual finger depressible keys, the cranks serving as retractible frets and being
 110 movable into contact with the undersides of the overlying chord strings to serve as selectively usable frets or stop devices, and the end of the neck adjacent said head being provided with a bridge including stationary
 115 members and movable members, the movable members having elements co-operable with predetermined strings for raising and lowering the pitch of said strings while the instrument is being played, and mechanical means for actuating said movable members, said
 120 means comprising a knee actuated slide having operating connection with said members through the instrumentality of a rockshaft.

7. A stringed musical instrument of the
 125 class described comprising a body of conventional shape, a neck attached to said body and formed at its left hand end with a head provided with ordinary string attaching and tuning devices, said neck being provided with
 130

a fingerboard having a restricted portion equipped with longitudinally spaced transversely disposed frets, the remainder of said fingerboard being smooth and without frets,
5 a group of three melody strings strung over the fretted portion of the fingerboard and anchored on the body and tuning devices, a second group of chord construction strings strung over the unfretted part of the finger-
10 board and anchored on the body and said tuning devices, and a plurality of normally inactive finger actuated mechanical frets mounted on said body and underlying the right-hand end portion of the strings of said
15 second-named group, said frets being selectively and individually usable.

In testimony whereof I affix my signature.

ROY M. SULLIVAN.

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