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PLUCKED STRING MUSICAL INSTRUMENT

Filed July 2, 1928

Fig. 1

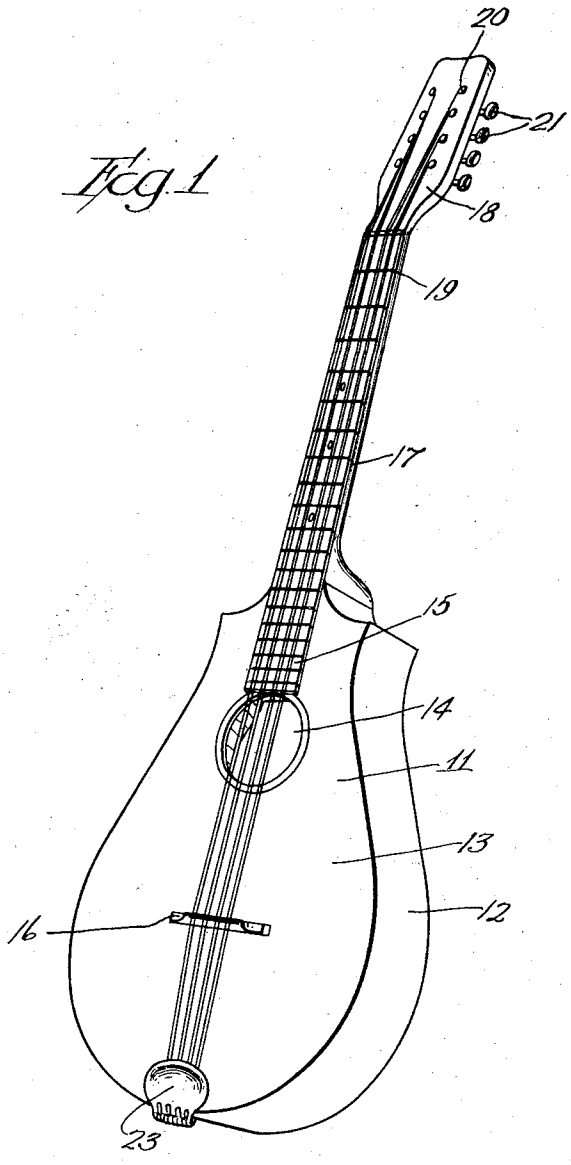
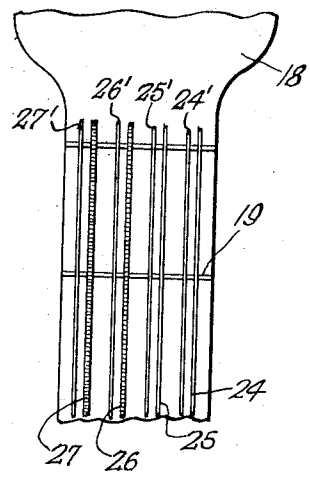


Fig. 2



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PLUCKED STRING MUSICAL INSTRUMENT

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The object of this invention is to provide a plucked string musical instrument of improved tone quality and in which the musical tones produced by the vibration of the strings are enriched and the resonance of the instrument is enhanced by increasing the natural harmonics or over-tones produced when the strings are vibrated.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a plucked string musical instrument constructed pursuant to the invention; and

Fig. 2 is a detailed plan view of the finger board, showing the improved combination and arrangement of the strings.

The plucked string instruments shown in the drawings may be termed, for convenience, a tenor guitar, although it may be played according to the tuning in a variety of other ways, for example, as a banjo, a ukelele, or a mandolin.

The guitar 11 comprises a hollow sound box or body 12, in the belly 13 of which is provided a sound hole 14 located underneath the strings between the lower end of the finger board 15 and the bridge 16. The neck 17 of the guitar extends from the top of the sound box 12 to the scroll or head 18. The finger board 15 is mounted on top of the neck 17 and extends thereover from the base of the scroll 18 and over the belly of the instrument substantially to the sound hole 14. As shown, the scroll 18 is inclined backwardly in the usual manner from the neck 17 and top of the finger board 15. If desired, the fingering of the instrument in playing may be assisted by a plurality of frets 19 which mark the tone positions of different pitch on the finger board.

The strings are secured at their upper ends to the tuning pins 20 which may be operated in the ordinary manner by tuning pegs 21. From the tuning pins 20 the strings are strung over the finger board 15 and bridge 16 mounted on the belly of the instrument and are secured at their lower ends to the tail piece 23 which is mounted at the bottom of the body or sound box 12 and projects over the belly 13.

In a string instrument of the type shown in the drawings, the musical tones are produced by plucking the strings either with the fingers or a plectrum to set the strings in vibration. The various intervals and tones of the scale are attained in playing by the usual method of fingering the strings on the finger board 15.

The illustrative instrument provides an improved combination of the strings which increases the natural harmonics of the fundamental tones produced in playing and thus enriches and beautifies the tone quality of the instrument. For convenience in illustrating the novel string combination provided by the invention, the drawing shows an application thereof to an eight-string instrument of the plucked string type. These strings comprise the four principal strings 24, 25, 26, 27 and four auxiliary strings 24′, 25′, 26′ and 27′. The principal strings are tuned in intervals of perfect fifths and comprise string 24 of pitch a'; string 25 of pitch d'; string 26 of pitch g; and string 27 of pitch c. The auxiliary strings are respectively mounted with the principal strings so as to constitute pairs of strings with said principal strings, which are positioned respectively close enough to the principal strings so that they must be vibrated concurrently with the principal strings when the latter are plucked with the fingers or with a plectrum. These auxiliary strings comprise auxiliary string 24′ of pitch a'; auxiliary string 25′ of pitch d'; auxiliary string 26′ of pitch g', and auxiliary string 27′ of pitch c'.

To more clearly understand the invention, the strings are tuned in the following manner:

Principal string 24 is a tenor banjo "A" string, tuned to pitch a'; auxiliary string 24′ is a tenor banjo "A" string tuned to pitch a'; principal string 25 is a tenor banjo "D" string tuned to pitch d'; aux-

iliary string 25′ is a tenor banjo "D" string tuned to pitch *d′*; principal string 26 is a tenor banjo "G" string tuned to pitch *g*; auxiliary string 26′ is a tenor banjo "A" string tuned to pitch *g′*; principal string 27 is a tenor banjo "C" string tuned to pitch *c*; and auxiliary string 27′ is a tenor banjo "D" string tuned to pitch *c′*.

Principal strings 24 and 25 of the instrument are provided with auxiliary strings 24′ and 25′. Because of the relatively higher pitch of the first and second strings, however, it may be preferable to employ for their auxiliary strings 24′ and 25′, strings of the same fundamental tone, as the principal strings 24 and 25, and to tune such auxiliary strings 24′ and 25′ so as to sound in unison with the first and second principal strings of the instrument. Thus the pairs of first and second strings 24—24′ and and 25—25′ both sound the same fundamental tones *a′* and *d′*, and the strings of each pair both produce harmonics in the same series. The use of pairs of strings tuned in unison in the higher strings of the instrument, however, doubles the volume of tone produced by these higher strings, thereby enriching and beautifying the tone quality.

The principal string 26, which may be tuned to the pitch *g*, may have its fundamental note and its harmonics produced by its own vibration enriched in like manner by its companion auxiliary string 26′. For the auxiliary string 26′ an A string may be provided whose fundamental note corresponds in pitch with the first string 24 of the instrument. The auxiliary string 26′ is raised in pitch one whole octave, however, so as to sound the note *g′*, or an octave above the fundamental tone *g* of principal string 26.

As both the principal and auxiliary strings 27 and 27′ also sound, in addition to their fundamental notes, their own natural harmonics, according to the usual laws affecting the vibration of the strings, the fundamental note of the principal string 27 is enriched not only by its own natural harmonics, but also by the fundamenal note C in alto of the auxiliary string 27′ together with the harmonics sounded by the auxiliary string. The harmonics of the auxiliary string are, for example, C in altissimo, its second harmonic, next, G in altissimo, the perfect fifth above and so on in the ascending series. It is evident that this combination of the two strings 27 and 27′, which are sounded simultaneously, greatly enriches and beautifies the tones produced by the vibration of principal string 27.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A plucked string musical instrument comprising, in combination, a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in pairs from the scroll over the finger board, sound box and bridge to the tail piece, said pairs of strings being arranged for simultaneous vibration of the respective two strings thereof in the playing of the instrument, the pairs of strings of lower pitch each consisting of a main string for sounding the fundamental tone and an auxiliary string of a pitch a perfect eighth above the fundamental tone of the main string, said auxiliary string being tuned a whole octave above its fundamental to sound simultaneously when played with said main string, the harmonic of the latter, and the pairs of strings of higher pitch, each constituting two strings having the same fundamental pitch tuned to sound in unison.

2. A plucked string musical instrument comprising, in combination, a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in combination from the scroll over the finger board, sound box and bridge to the tail piece, said combination of strings being arranged for simultaneous vibration of the respective strings thereof in the playing of the instrument, the combinations of strings of lower pitch each including a main string for sounding the fundamental tone, and an auxiliary string of a higher pitch tuned to sound the harmonic of said main string when played simultaneously with said main string, and the combinations of strings of higher pitch having the several strings of the respective groups tuned to sound in unison.

3. A plucked string musical instrument comprising, in combination, a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in pairs from the scroll over the finger board, sound box and bridge to the tail piece, said pairs of strings being arranged for simultaneous vibration of the respective two strings thereof in the playing of the instrument, the pairs of strings of lower pitch each consisting of a main string for sounding the fundamental tone, and an auxiliary string of a higher pitch tuned to sound, when played with said main

string, a harmonic of the latter and the pairs of strings of higher pitch, each constituting two strings having the same fundamental pitch tuned to sound in unison.

4. A plucked string musical instrument comprising, in combination a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in pairs from the scroll over the finger board, sound box and bridge to the tail piece, said strings being so arranged for simultaneous vibration of the two strings of each pair in the playing of the instrument, and pairs of said strings consisting of a main string for sounding the fundamental tone, and an auxiliary string of a pitch a perfect eighth above the fundamental tone of the main string, said auxiliary string being tuned a whole octave above its fundamental to sound simultaneously when played with said main string, the harmonic of the latter.

5. A plucked string musical instrument comprising, in combination, a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in pairs from the scroll over the finger board, sound box and bridge to the tail piece, said strings being so arranged for simultaneous vibration of the two strings of each pair in the playing of the instrument, and pairs of said strings consisting of a main string for sounding the fundamental tone and an auxiliary string of a pitch higher than said fundamental tone and tuned to sound the harmonic of said main string when played simultaneously with the latter.

6. A plucked string musical instrument comprising, in combination, a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in combinations from the scroll over the finger board, sound box and bridge to the tail piece, said strings being arranged in combinations for simultaneous vibration of the several strings of each combination in the playing of the instrument, and a plurality of said string combinations each including a main string for sounding the fundamental tone, and an auxiliary string tuned to sound simultaneously with said main string, the harmonic of the latter.

7. A plucked string musical instrument comprising, in combination, a sound box or body, the tail piece, the bridge, the neck, the scroll above the neck, the finger board extending over the neck and vibratory strings strung in combinations from the scroll over the finger board, sound box and bridge to the tail piece, said strings being arranged in combinations for simultaneous vibration of the several strings of each combination in the playing of the instrument, and a plurality of said string combinations consisting of a main string for sounding the fundamental tone and an auxiliary string tuned to sound with said main string a harmonic interval of the tone sounded by said main string.

8. A guitar type musical instrument, in which the strings are strung in pairs for simultaneous vibration of the two strings of each pair in the playing of the instrument, the pairs of strings of the lower register each consisting of a main string for sounding the fundamental tone and an auxiliary string tuned to sound the harmonic of said main string, and the pairs of strings of the upper register, each comprising two strings having the same fundamental pitch tuned to sound in unison.

9. A guitar type musical instrument, in which the strings are strung in combinations for simultaneous vibration of the several strings of each combination in the playing of the instrument, and a plurality of said string combinations including a main string for sounding the fundamental tone, and an auxiliary string higher in pitch than said main string and tuned to sound simultaneously with said main string, the harmonic of the latter.

10. A guitar type musical instrument, in which the strings are strung in combinations for simultaneous vibration of the several strings of each combination in the playing of the instrument, and a plurality of said string combinations including a main string for sounding the fundamental tone, and an auxiliary string higher in pitch than said main string and tuned to sound simultaneously with said main string, a harmonic of the latter.

11. A guitar type musical instrument, comprising a plurality of strings strung in pairs, the strings of each pair being tuned in unison and arranged for simultaneous vibration in the palying of said instrument, and a plurality of lower pitched strings strung in pairs, the strings of said pairs being arranged for simultaneous vibration in playing the instrument, each said pair of lower pitched strings having a main string and an auxiliary string higher in pitch than said main string, said auxiliary string being tuned to sound a harmonic of the tone sounded by said main string.

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