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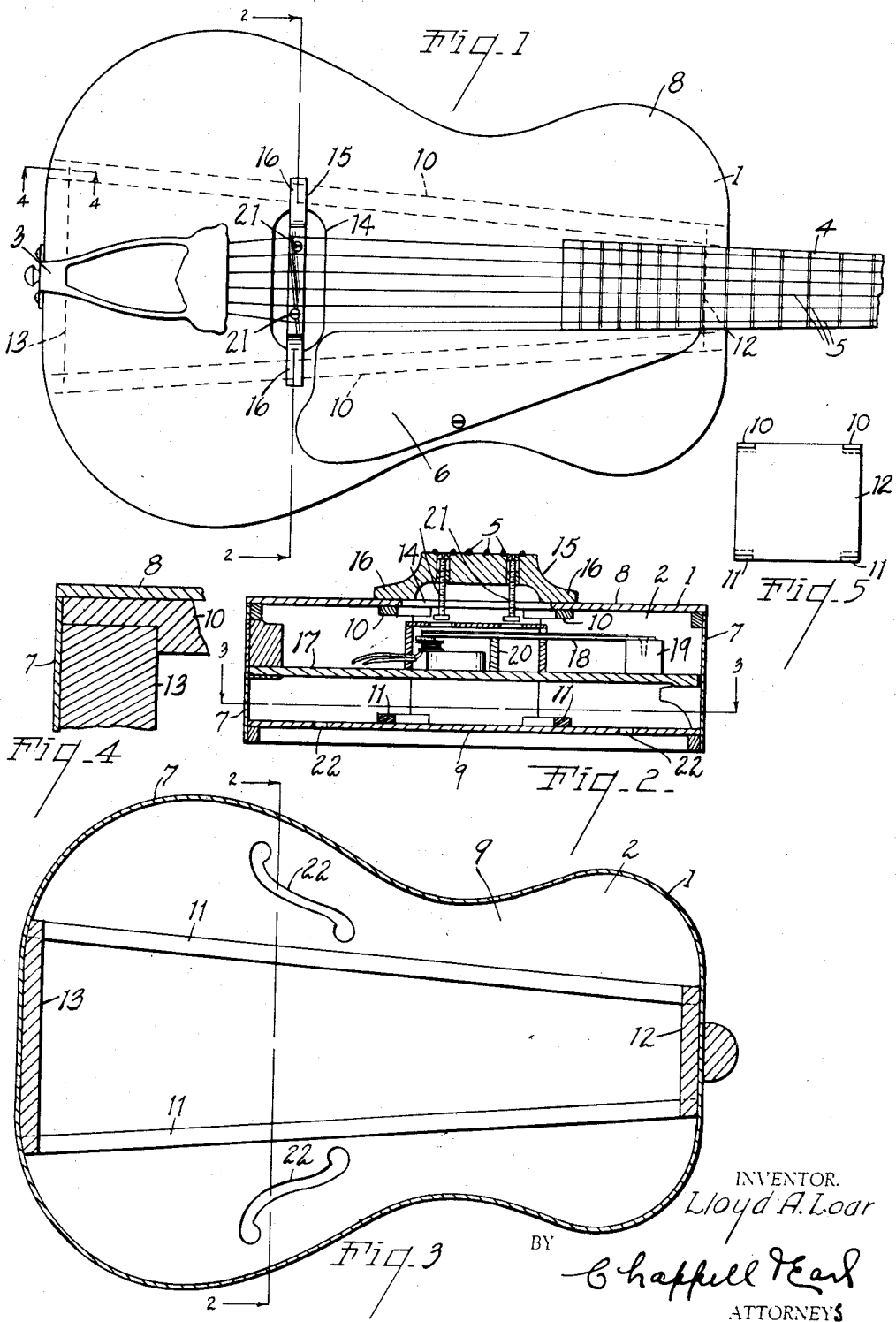
L. A. LOAR

2,020,557

STRINGED MUSICAL INSTRUMENT

Filed May 14, 1934

2 Sheets-Sheet 1



INVENTOR.
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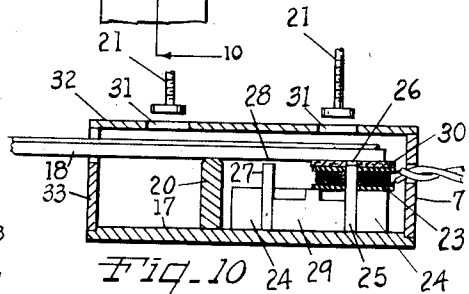
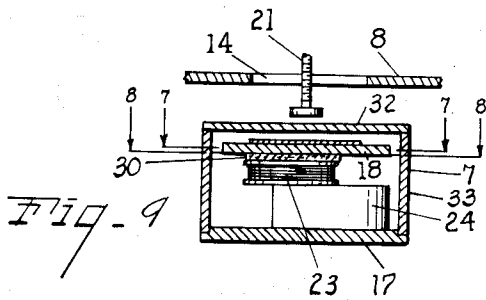
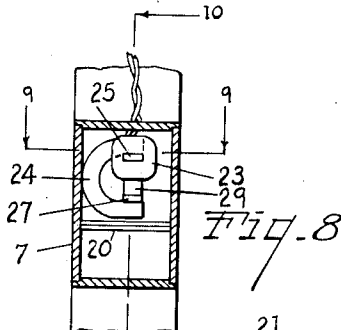
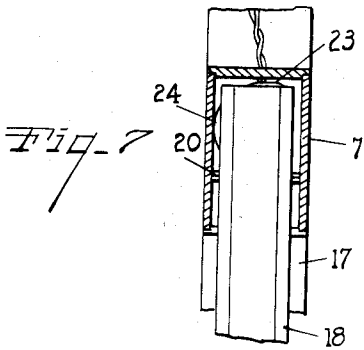
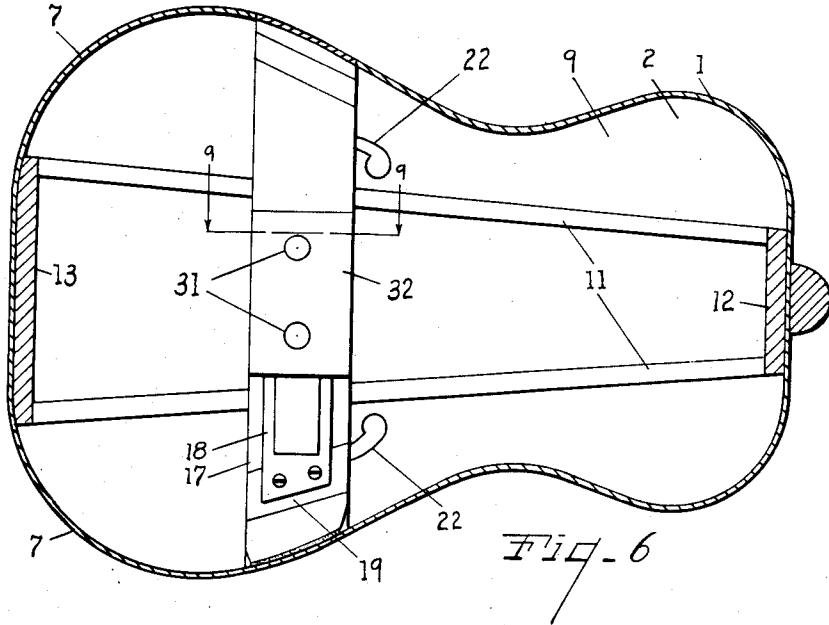
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STRINGED MUSICAL INSTRUMENT

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2 Sheets-Sheet 2



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2,020,557

STRINGED MUSICAL INSTRUMENT

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corporation of Michigan

Application May 14, 1934, Serial No. 725,495

12 Claims. (Cl. 84—1)

The main objects of this invention are:

First, to provide an improved musical instrument of the stringed type such as the guitar, mandolin, violin and the like.

Second, to provide a stringed instrument characterized by a beautiful tone, large volume and a high degree of sound-board sensitivity.

Third, to provide a stringed instrument having the above desirable features and characteristics and which is simple and economical in its parts and efficient and effective in operation, the instrument being well adapted for both mechanical and electrical amplification without interference.

Objects relating to details and economies of my invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary top plan view of a guitar embodying the features of my invention.

Fig. 2 is a transverse section on a line corresponding to line 2—2 of Figs. 1 and 3.

Fig. 3 is a section on a line corresponding to line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary detail section on a line corresponding to line 4—4 of Fig. 1.

Fig. 5 is an end view of the head block showing the connection of the ends of the tone bars therewith.

Fig. 6 is a horizontal section through the body of the instrument showing the pick-up unit in place therein.

Fig. 7 is a fragmentary horizontal section taken on a line corresponding to line 7—7 of Fig. 9.

Fig. 8 is a similar section taken on a line corresponding to line 8—8 of Fig. 9.

Fig. 9 is an enlarged fragmentary transverse section taken on a line corresponding to line 9—9 of Fig. 8.

Fig. 10 is an enlarged fragmentary transverse section taken on a line corresponding to line 10—10 of Fig. 8.

In the illustrated embodiment of my invention, numeral 1 in general indicates a guitar, the guitar being a typical example of a stringed instrument contemplated by my invention. The guitar 1 has a hollow body 2 provided with the usual tailpiece 3, headpiece 4, and strings 5. A finger rest is shown at 6.

The hollow body 2 comprises a continuous side wall 7 and primary and secondary sound-boards 8 and 9 respectively. For vibrating the sound-boards in unison, I provide each with a pair of

tone bars fixedly secured to the inner side thereof, the tone bars of the primary sound-boards being indicated at 10, 10 and those of the secondary sound-board at 11, 11. The ends of the tone bars are connected as shown to the head block 12 and the tail block 13, the latter being wider than the former so that the bars of each pair diverge from the head block toward the tail block.

The tone bars of opposite pairs are disposed in substantially parallel relation. Their ends and the corners of the end blocks are cut and fitted as shown, the parts being glued or otherwise cemented together so that the vibrations of the primary sound-board are transmitted mechanically to the secondary sound-board. The blocks are preferably relatively long and narrow as shown.

I provide the primary sound-board 8 with a single sound-hole 14 arranged transversely as shown between the tone bars 10, 10, the primary sound-board being otherwise imperforate. Over this sound-hole, I dispose a transverse string bridge 15 having its feet 16, 16 mounted on the primary sound-board directly above the tone bars 10, 10. In the present case, the feet of the bridge rest on the primary sound-board, the string tension acting to hold the bridge in place. This arrangement of the sound-hole and bridge results in a high degree of board sensitivity with the maximum amount of sound-board surface left for vibration.

The second sound-board 9 is provided with the usual *f*-sound-holes 22, 22, these sound-holes being arranged between the edges of the board and the tone bars 11, 11.

I make the primary sound-board continuous or imperforate from each foot of the bridge to all edges of the board so that there is no interruption in the travel of vibration from the feet of the bridge to the edges of the board. I also place the sound-hole where the vibration in the board is greatest; that is, directly under the bridge. The vibration in the board weakens as it travels away from the bridge so that the edges of the sound-hole vibrate with the greatest possible intensity and consequently add to the efficiency of air vibration in the body at the place where this air vibration is in contact with the outside air through the sound hole.

For electrical amplification, I provide the instrument with a pick-up unit 17 in the form of a drawer adapted to be inserted and removed through an opening provided therefor in the side of the wall 7. The pick-up unit has a transverse

armature bar 18 disposed under the sound-hole 14, one end of the armature bar being anchored at 19 and the other free end thereof being provided with a fulcrum 20 spaced therefrom. Posts 21, 21 are threaded to the string bridge 15, as shown, for adjustment into and out of engagement with the armature bar 18, the posts being arranged at opposite sides of the fulcrum 20. The posts are shown out of engagement with the armature bar so that the instrument is adapted for mechanical amplification only. By adjusting the posts so as to engage the armature bar, electrical amplification is provided.

When the posts 21 are adjusted into contact with the armature bar 18, the bridge is lifted out of contact with the sound-board 8 for electrical amplification. Both mechanical and electrical amplification may be obtained simultaneously if desired by adjusting the sound posts 21 into engagement with the armature bar 18 without raising the bridge 15 from contact with the sound-board.

By simply screwing in the adjustment posts, all of the string pressure or any part of it can be placed directly on the armature bar of the pick-up. By adjusting the posts out of engagement with the bar, all of the string pressure goes directly to the primary sound-board which controls the vibration of the secondary sound-board through the tone bars and end blocks.

My construction is readily available for use in both ways; that is to say, without the pick-up for sound-board playing only, the pick-up and adjustment posts being added when wanted; and both mechanical and electrical amplification are available without one interfering with the other.

The pick-up unit which I prefer to use comprises a generator coil 23 arranged for cooperation with the free end of the armature bar 18, the coil being mounted on a permanent magnet 24 and having a core 25 of magnetic material slightly spaced from the armature bar to provide an air gap 26. A member 27 of magnetic material is arranged outside of the coil to provide another air gap 28 with the free end of the armature bar. A block of wood 29 is disposed between the members 25 and 27 for coaction with the magnet 24 to hold the members 25 and 27 in place. A piece 30 of felt is arranged between the armature bar and the top of the coil 23. Openings 31 are provided in the cover 32 of the housing 33 enclosing the free ends of the armature bar 18, the openings 31 being arranged under the post 21 for the passage of the latter into and out of engagement with the armature bar. Thus, when the posts 21 are adjusted into engagement with the armature bar, the latter is vibrated by the vibration of the strings, resulting in the generation of electrical impulses in the coil 30. The output of the coil is delivered to suitable sound apparatus, such as an amplifier and loud speaker (not shown), so that a faithful translation is the result.

As a result of my construction, the stringed instrument has a very beautiful tone and one which also has a large volume even where mechanical amplification only is used. The instrument has a high degree of board sensitivity and a maximum amount of board surface for vibration.

I have illustrated and described my improvements in an embodiment which I have found very practical. I have not attempted to illustrate or describe other embodiments or adaptations, as it is believed this disclosure will enable those skilled

in the art to embody or adapt my improvements as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A stringed musical instrument of the character set forth, comprising in combination a hollow body having a continuous side wall and spaced primary and secondary sound-boards, head and tail blocks fixedly secured to the inner side of said body at the side wall, the head block being relatively narrow, a pair of tone bars fixedly secured to the inner side of each of said sound-boards and connected at their ends to said head and tail blocks, the bars of opposite pairs being disposed in parallel relation, the bars of each pair converging toward the head block, the primary sound-board having a transverse sound-hole between its pair of tone bars and being otherwise imperforate, and a transverse string bridge disposed over said sound-hole and having its feet mounted on said primary sound-board above the tone bars, the secondary sound-board having sound-holes between its edges and the tone bars, a pick-up unit having a transverse armature bar disposed under said sound-hole, and posts threaded to said string bridge for adjustment into and out of engagement with said armature bar, the armature bar being anchored at one end and having a fulcrum spaced from its free end and disposed between said posts.

2. A stringed musical instrument of the character set forth, comprising in combination a hollow body having a continuous side wall and spaced primary and secondary sound-boards, head and tail blocks fixedly secured to the inner side of said body at the side wall, the head block being relatively narrow, a pair of tone bars fixedly secured to the inner side of each of said sound-boards and connected at their ends to said head and tail blocks, the bars of opposite pairs being disposed in parallel relation, the bars of each pair converging toward the head block, the primary sound-board having a transverse sound-hole between its pair of tone bars and being otherwise imperforate, and a transverse string bridge disposed over said sound-hole and having its feet mounted on said primary sound-board above the tone bars, the secondary sound-board having sound-holes between its edges and the tone bars.

3. A stringed musical instrument of the character set forth, comprising in combination a hollow body having a continuous side wall and spaced primary and secondary sound-boards, head and tail blocks fixedly secured to the inner side of said body at the side wall, a pair of tone bars fixedly secured to the inner side of each of said sound-boards and connected at their ends to said head and tail blocks, the primary sound-board having a transverse sound-hole between its pair of tone bars and being otherwise imperforate, and a transverse string bridge disposed over said sound-hole and having its feet mounted on said primary sound-board above the tone bars.

4. A stringed musical instrument of the character set forth, comprising in combination a sound-board having a transverse sound-hole and being otherwise imperforate, a transverse string bridge disposed over said sound-hole and mounted on said sound-board, a pick-up having a transverse armature bar disposed under said sound-hole, and posts threaded to said string bridge for adjustment into and out of engagement with said armature bar, the armature bar being anchored

at one end and having a fulcrum spaced from its free end and disposed between said posts.

5 5. A stringed musical instrument of the character set forth, comprising in combination a sound-board having a sound-hole and being otherwise imperforate, a string bridge disposed over said sound-hole and mounted on said sound-board, a pick-up having an armature bar disposed under said sound-hole, and posts threaded to said string bridge for adjustment into and out of engagement with said armature bar.

10 6. A stringed musical instrument of the character set forth, comprising in combination a hollow body having primary and secondary sound-boards, head and tail blocks fixedly secured to the inner side of said body, the head block being relatively narrow, a pair of tone bars fixedly secured to the inner side of each of said sound-boards and connected at their ends to said head and tail blocks, the bars of opposite pairs being disposed in parallel relation, the bars of each pair converging toward the head block, the primary sound-board having a sound-hole between its pair of tone bars and being otherwise imperforate, and a string bridge disposed over said sound-hole and mounted on said primary sound-board above the tone bars, a pick-up having an armature disposed under said sound-hole, and posts threaded to said string bridge for adjustment into and out of engagement with said armature.

15 7. A stringed musical instrument of the character set forth, comprising in combination a hollow body having primary and secondary sound-boards, head and tail blocks fixedly secured to the inner side of said body, the head block being relatively narrow, a pair of tone bars fixedly secured to the inner side of each of said sound-boards and connected at their ends to said head and tail blocks, the bars of opposite pairs being disposed in parallel relation, the bars of each pair diverging toward the head block, the primary sound-board having a sound-hole between its pair of tone bars and being otherwise imperforate, and a string bridge disposed over said sound-hole and mounted on said primary sound-board above the tone bars.

20 8. A stringed musical instrument of the character set forth, comprising in combination a hollow body having primary and secondary sound-boards, head and tail blocks fixedly secured to the inner side of said body, a pair of tone bars fixedly secured to the inner side of each of said

sound-boards and connected at their ends to said head and tail blocks, the primary sound-board having a sound-hole between its pair of tone bars, and a string bridge disposed over said sound-hole and mounted on said primary sound-board above the tone bars.

25 9. In a stringed musical instrument, the combination of a hollow body comprising front and rear sound-boards having pairs of tone bars disposed in opposed relation and diverging toward the tail-piece, and a bridge mounted on the front sound-board, the front sound-board having an elongated sound opening directly below the bridge, the bridge having feet disposed at the ends of the opening and resting upon the front sound-board above the tone bars thereof, the rear sound-board having sound openings at the outside of its tone bars.

30 10. In a stringed musical instrument, the combination of a hollow body comprising front and rear sound-boards having pairs of tone bars disposed in opposed relation, and a bridge mounted on the front sound-board, the front sound-board having a sound-opening directly below the bridge, the bridge having feet disposed at opposite sides of the opening, the rear sound-board having sound openings at the outside of its tone bars.

35 11. In a stringed musical instrument, the combination of a hollow body comprising front and rear sound-boards, the front sound-board having a sound-opening disposed centrally thereof, a bridge disposed above said sound-opening with its feet resting upon the front sound-board at opposite edges of the opening whereby the zone of the sound-board surrounding the opening is subjected to maximum amplitude of vibrations of the bridge, and tone bars disposed in opposed aligned pairs on said board, the tone bars of the front sound-board being under the feet of the bridge.

40 12. In a stringed musical instrument, the combination of a hollow body comprising front and rear sound-boards, the front sound-board having a sound-opening disposed centrally thereof, and a bridge disposed above said sound-opening with its feet resting upon the front sound-board at opposite edges of the opening whereby the zone of the sound-board surrounding the opening is subjected to maximum amplitude of vibrations of the bridge.

LLOYD A. LOAR.