

April 5, 1938.

C. GUGINO

2,113,446

STRINGED MUSICAL INSTRUMENT

Filed Nov. 30, 1935

3 Sheets-Sheet 1

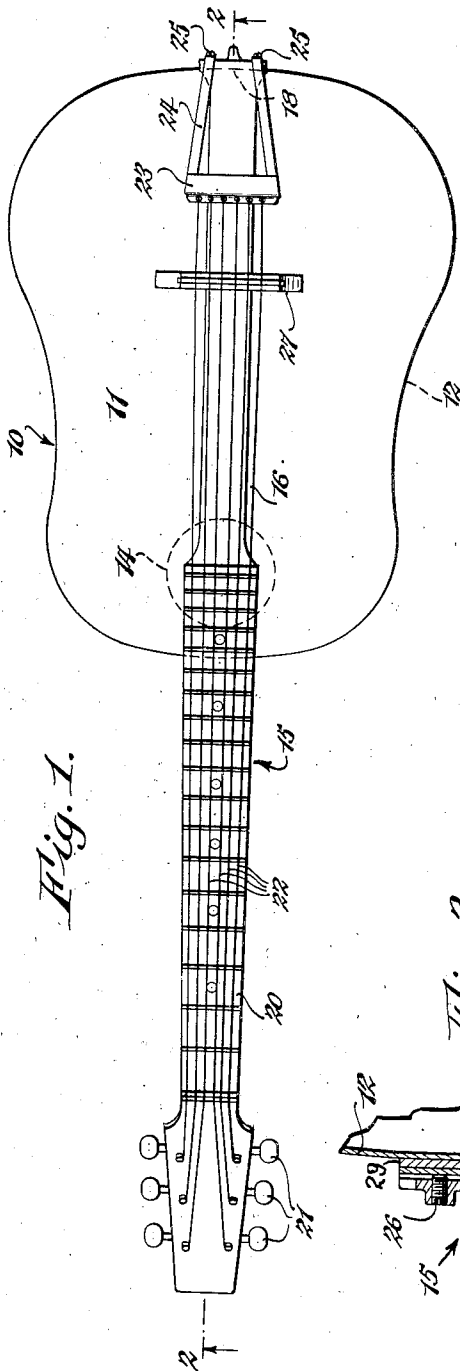


Fig. 1.

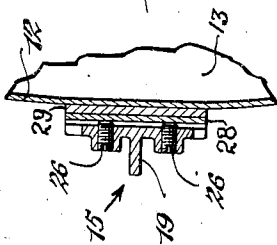


Fig. 3.

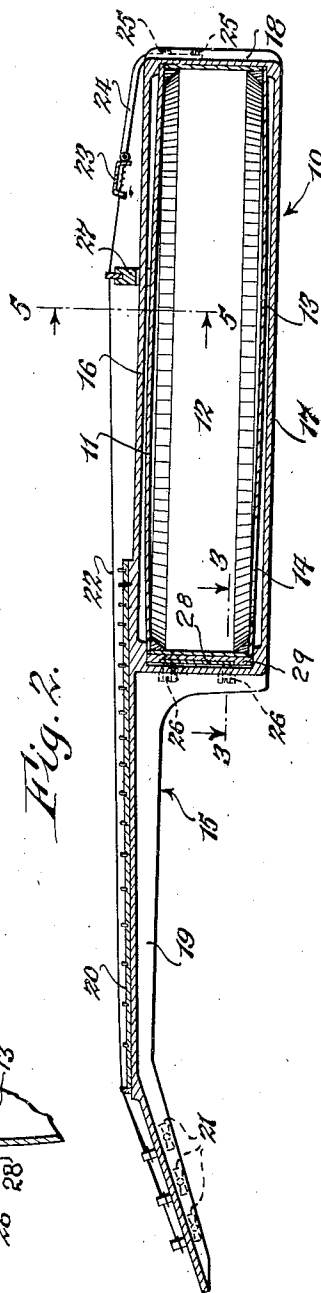


Fig. 2.

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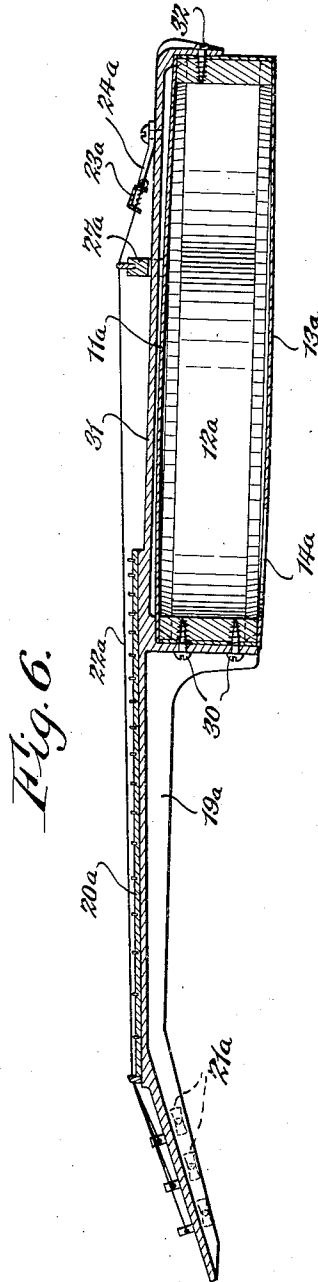
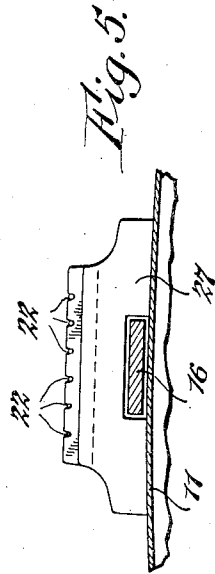
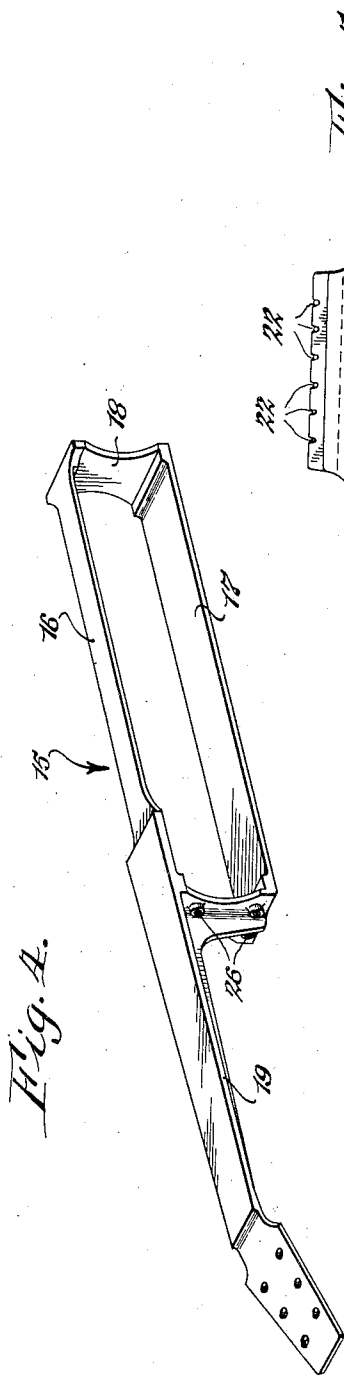
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3 Sheets-Sheet 2



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STRINGED MUSICAL INSTRUMENT

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3 Sheets-Sheet 3

Fig. 7

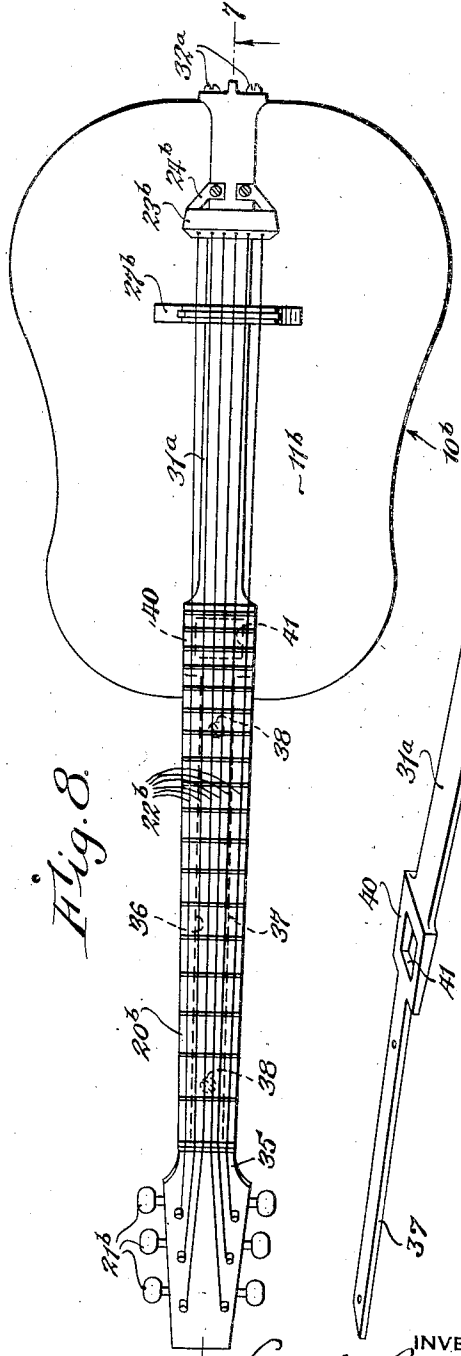
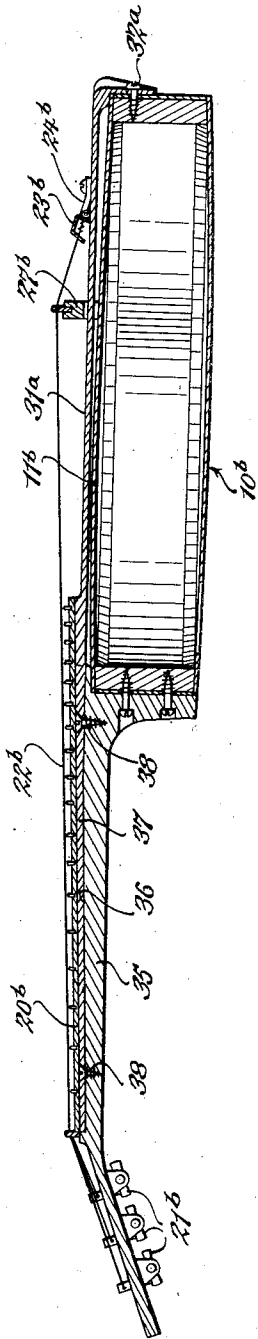


Fig. 8

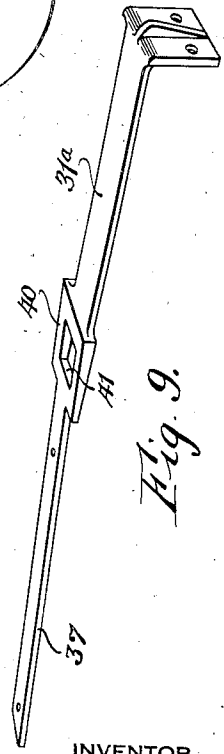


Fig. 9

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# UNITED STATES PATENT OFFICE

2,113,446

## STRINGED MUSICAL INSTRUMENT

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Application November 30, 1935, Serial No. 52,371

8 Claims. (Cl. 84-293)

This invention relates to a stringed instrument and more particularly to a stringed instrument of the guitar or mandolin type in which the construction is composed of a sound box, a neck and strings under relatively great tension connecting the extremities of the neck and the sound box.

With instruments such as guitars or mandolins where a relatively large number of strings are employed and where the strings are under a comparatively high tension, the tension of the strings tends to bend the neck upwardly and to distort the sound box. As this occurs the strings gradually move away from the fingerboard and render the instrument more and more difficult to play since the performer is required to use a great deal more finger pressure in fingering the strings and also is required to move them a greater distance to engage the frets of the fingerboard. The tonal qualities of the instrument are also adversely affected by the distortion of the instrument and with the abnormally high strings, of course, it is impossible to finger the instrument expertly. In addition to this, the accuracy of each individual note played upon the strings is impaired due to the fact that each string is put under excessive tension and its pitch thereby considerably changed when the player moves said string laterally an inordinate distance into contact with the desired fret.

While different manufacturers attempt to strengthen the neck so as to avoid this effect and some manufacturers also have introduced means for adjustably strengthening the neck to avoid this effect, none of these means have been wholly satisfactory and, moreover, such means have greatly increased the cost of the instrument. It is the object of this invention to provide a musical instrument of the guitar or mandolin type in which the strings are connected at their opposite ends to a single member which extends the full length of the neck and sound box and to which the sound box is separately connected, the strings having no direct connection with the sound box and the member carrying them being sufficiently rigid to adequately resist the tendency of the strings to distort the neck. In the preferred embodiment of the invention the sound box is made of a separate unit and is inserted in a structure which forms the neck of the instrument and also a band completely encircling the sound box, the strings being secured to opposite ends of this structure and being connected with the sounding board of the

sound box exclusively by the bridge which straddles the adjacent part of the string carrying structure.

In the accompanying drawings:

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

Fig. 2 is a vertical longitudinal section, taken on line 2-2, Fig. 1.

Fig. 3 is a fragmentary enlarged horizontal section, taken on line 3-3, Fig. 2.

Fig. 4 is a perspective view of the string carrying element embodying my invention.

Fig. 5 is an enlarged fragmentary vertical transverse section, taken on line 5-5, Fig. 2.

Fig. 6 is a view similar to Fig. 2 showing a modified form of my invention.

Fig. 7 is a vertical longitudinal section, taken on line 7-7, Fig. 8 of another modified form of my invention.

Fig. 8 is a top plan view of this modified form.

Fig. 9 is a perspective view of the string carrying element in the modified form shown in Figs. 7 and 8.

The invention is shown as embodied in a guitar. The sound box 10 of my invention can be of any usual and well known form and preferably comprises an imperforate sounding board 11 and side walls 12 connecting this sounding board with the back 13 of the sound box. The sounding board need not be imperforate, however, and can have the usual sound holes. The sound opening 14 of the instrument is preferably cut in the back rather than in the sounding board to improve the tonal qualities of the instrument. The sounding board and back of the sound box are preferably crowned in accordance with standard practice but it will be noted that this sound box is a separate unit and is unprovided with a neck.

This sound box is inserted in a string supporting structure 15, best illustrated in Fig. 4. The member 15 is preferably made of metal and comprises an upper compression bar 16, a lower tension bar 17, an outer end wall 18 connecting these bars at their outer ends and a neck 19 connecting these bars at their other ends and also forming the neck of the instrument. The usual fingerboard 20 is mounted upon the neck 19 and the keys 21 adjusting the tension of the strings 22 are carried, in the usual manner, at the extreme end of the neck. The opposite ends of the strings 22 are anchored in a cross bar 23 which is connected by small straps 24 with screws 25 which secure these straps to the vertical end wall 18 as best illustrated in Figs. 55

1 and 2. The screw holes for anchoring the screws 25 extend only part way through the wall 18 and hence are not illustrated in Fig. 4.

The spacing between the tension and compression bars 17 and 16 and the wall 18 and the neck 19 is such that the sound box can be inserted in the box-like structure so formed and the sound box is preferably securely held in this inserted position by means of small set screws 26. These set screws 26 bear against a metal plate 28 set into a wooden block 29, this block bearing against the sound box and acting as a spacer or shim and also preventing mutilation of the end wall of the sound box by the set screws 26. The vibrations from the strings 22 are conducted to the sounding board of the sound box by a bridge 27 which supports each of the strings and straddles the compression member 16, as best shown in Fig. 5. The bridge 27 is at all times spaced from the compression member 16, although it has been found that contact between the bridge and this compression member does not seriously impair the tonal qualities of the instrument.

With the instrument made as described it will be seen that the longitudinal tension of these strings is taken exclusively by the metal structure forming the neck and sound box embracing portion of the instrument and this structure can, of course, be made sufficiently strong so that the strings cannot bow or distort this structure. Further, since none of the tension of the strings is borne by the sound box, except through the necessary bridge 27, it will be seen that the sound box cannot be distorted by the constant longitudinal tension of the strings. It will further be seen that the invention adapts itself to restoring distorted guitars to service since if the neck of a guitar has become so bent as to render it unfit for service, the neck can be cut off and the sound box inserted in a string supporting structure made in accordance with my invention.

The invention can also be built into a guitar when it is made, this form of the invention being illustrated in Fig. 6. In this form of the invention the sound box, as in the other form, consists of an imperforate sounding board 11a connected by side walls 12a to the back 13a which preferably contains the sound opening 14a, as in the first form of the invention. The neck 19a is made of metal and is secured, as by screws 30, with the sound box. The neck structure includes an extension 31 which is in the form of a compression bar extending longitudinally and centrally over the sounding board 11a and is straddled by the bridge 27a in the same manner as the compression member 16 in the first form of the invention. The outer extremity of the compression bar 31 is secured, as by screws 32, to the outer end of the sound box. The strings are anchored to the compression bar 31 by means of a cross bar 23a and straps 24a similar to the cross bar and straps 23, 24 in the first form of the invention. The neck 19a carries a fingerboard 20a and also carries the usual keys 21a by means of which the tension of the strings 22a is adjusted. As with the other form of the invention it will be seen that the tension of the strings is taken by the compression bar 31 and the neck 19a and that by making these parts sufficiently rigid the tendency of the strings to warp the neck can be completely avoided. By providing a continuous bar from one end of the strings to the other it will also be seen that the strings do not in any way tend to distort the sound box since their only pressure

against the sound box is exerted by the necessary bridge 27a.

In the modified form of the invention, shown in Figs. 7-9, a standard wooden neck 35 is used, this neck being connected to the sound box in the usual manner, either by dovetailing and gluing or by means of screws as shown. The upper side of the wooden neck 35 is provided with a longitudinal groove 36 which receives the longitudinal extension 37 of a compression member 31a. The longitudinal extension 37 fills the groove 36 and is secured therein by means of countersunk screws 38. This compression member extends longitudinally and centrally over the sounding board 11b and is straddled by the bridge 27b in the same manner as the compression member 31 of the form of the invention shown in Fig. 6. The outer end of the compression bar 31a is secured, as by screws 32a, to the outer end of the sound box and the strings are anchored by means of a cross bar 23b and straps 24b in the same manner as in the form of the invention shown in Fig. 6. The neck 35 carries a fingerboard 20b and the usual keys 21b by means of which the tension of the strings 22b is adjusted. This fingerboard is mounted on the neck 35 and over the forward extension 37 of the compression member 31a. Due to the fingerboard 20b extending back over the sound box, the forward extension 41 is widened as at 40 (Fig. 9) and an opening 41 is formed at this point to reduce the weight of the compression member. In this manner the tension of the strings is taken entirely by the compression bar 31a and its forward extension 35, thereby preventing distortion of the sound box which highly impairs the serviceability of the instrument.

From the foregoing it is apparent that the present invention provides a very simple and inexpensive means for greatly increasing the life of stringed instruments, such as guitars and mandolins, since the strings are prevented from distorting the neck or sound box of the instrument and are therefore prevented from moving away from the fret because of such distortion and preventing proper fingering of the instrument.

I claim as my invention:

1. A stringed musical instrument comprising, a sound box, a neck attached to said sound box, a compression bar secured to and extending from the inner end of said neck centrally along the exterior of said sound box and spaced therefrom to a point adjacent the opposite end of said sound box, strings connected at one end to said neck and at their opposite ends to the outer end of said compression bar and a bridge interposed between the intermediate portions of said strings and said sound box, said compression bar and neck forming a string carrying structure relieving said sound box of strain therefrom.

2. A stringed musical instrument comprising, a sound box, a metal neck attached to said sound box, a metal compression bar secured to and extending from the inner end of said neck to a point adjacent the opposite end of said sound box, strings connected at one end to said neck and at their opposite ends to the outer end of said compression bar and a bridge interposed between the intermediate portions of said strings and said sound box, said compression bar and neck forming a string carrying structure relieving said sound box of strain therefrom.

3. A stringed musical instrument comprising, a sound box, a wooden neck secured to said sound box, a metal member extending along and rein-

forcing said wooden neck and secured thereto, a compression bar secured to and forming a continuation of said reinforcing member and extending to a point adjacent the opposite end of said sound box, strings connected at one end to the reinforced neck and at their opposite ends to the outer end of said compression bar and a bridge interposed between the intermediate portions of said strings and said sound box, said compression bar and neck forming a string carrying structure relieving said sound box of strain therefrom.

4. A stringed musical instrument comprising, a sound box, a wooden neck secured to said sound box, a metal member extending along and reinforcing said wooden neck and secured thereto, a compression bar secured to and forming a continuation of said neck and extending centrally along the exterior of said sound box in spaced relation thereto to a point adjacent the opposite end of said sound box, strings connected at one end to the reinforced neck and at their opposite ends to the outer end of said compression bar and a bridge interposed between the intermediate portions of said strings and said sound box and bridging said compression bar, said compression bar and neck forming a string carrying structure relieving said sound box of strain therefrom.

5. A stringed musical instrument comprising, a sound box, a wooden neck secured to said sound box, a metal member extending along and reinforcing said wooden neck and secured thereto, a compression bar secured to and forming a continuation of said reinforcing member and extending centrally along the exterior of said sound box in spaced relation thereto to a point adjacent the opposite end of said sound box, means connecting the outer end of said compression bar with said opposite end of said sound box, strings connected at one end to the reinforced neck and at their opposite ends to the outer end of said compression bar and a bridge interposed between the intermediate portions of said strings and said sound box and bridging said compression bar, said compression bar and neck forming a string carrying structure relieving said sound box of strain therefrom.

6. A stringed musical instrument comprising, a sound box, a wooden neck secured to said sound

box, a metal member extending along and reinforcing said wooden neck and secured thereto, a compression bar integral with and forming a continuation of said reinforcing member and extending to a point adjacent the opposite end of said sound box, strings connected at one end to the reinforced neck and at their opposite ends to the outer end of said compression bar and a bridge interposed between the intermediate portions of said strings and said sound box, said compression bar and neck forming a string carrying structure relieving said sound box of strain therefrom.

7. A stringed musical instrument comprising a sound box, an open sided generally rectangular frame centrally encompassing said sound box parallel with the major axis of the instrument and comprising an upper compression bar extending along the exterior of the sound board of said sound box and spaced therefrom, a lower bar extending under said sound box and vertical end pieces connecting said upper and lower bars, a neck extending outwardly from said frame and forming a continuation of said compression bar, strings connected at one end to said neck and at their opposite ends to the opposite extremity of said compression bar, a bridge interposed between the intermediate portions of said strings and said sound box and means for retaining said sound box in said frame.

8. A stringed musical instrument comprising a sound box, an open sided generally rectangular unitary metal frame centrally encompassing said sound box parallel with the major axis of the instrument and comprising an upper compression bar extending along the exterior of the sound board of said sound box and spaced therefrom, a lower bar extending under said sound box and vertical end pieces connecting said upper and lower bars, a neck extending outwardly from said frame and forming a continuation of said compression bar, strings connected at one end to said neck and at their opposite ends to the opposite extremity of said compression bar, a bridge interposed between the intermediate portions of said strings and said sound box and means for retaining said sound box in said frame.

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