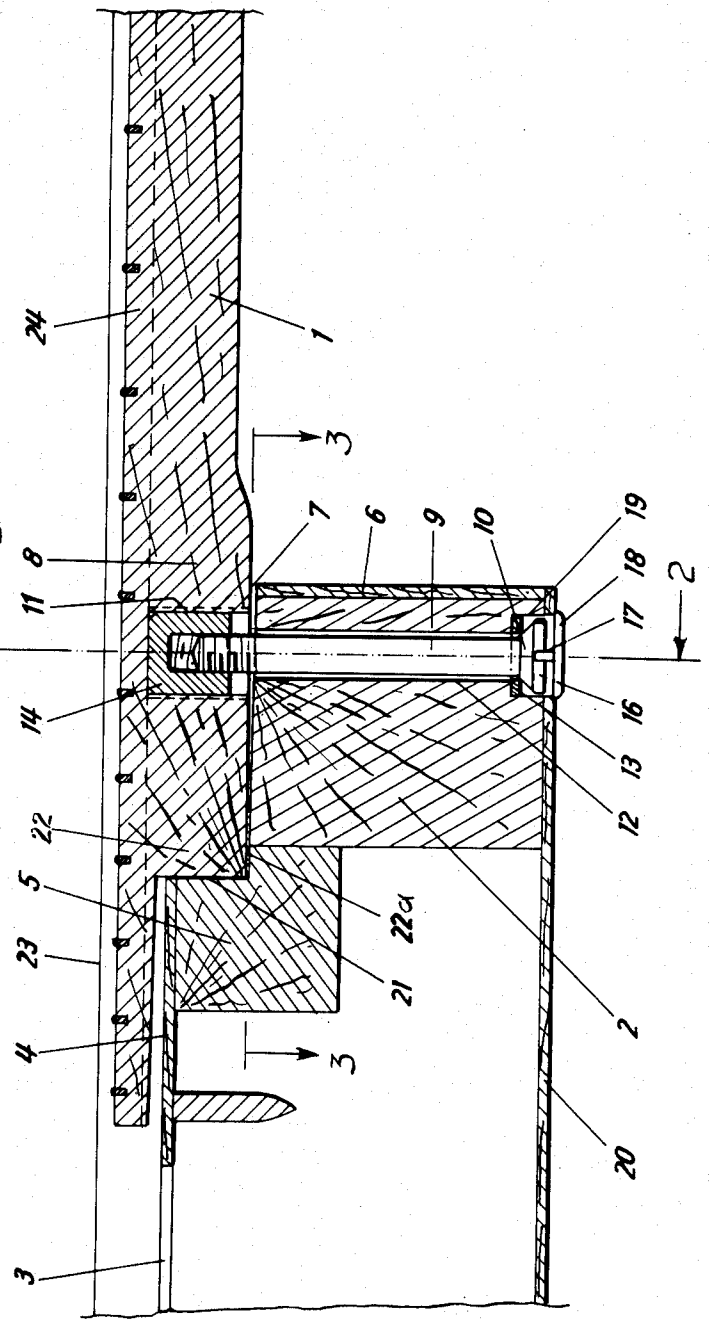
Sept. 7, 1965 D. HOPF 3,204,510

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Fig. 1



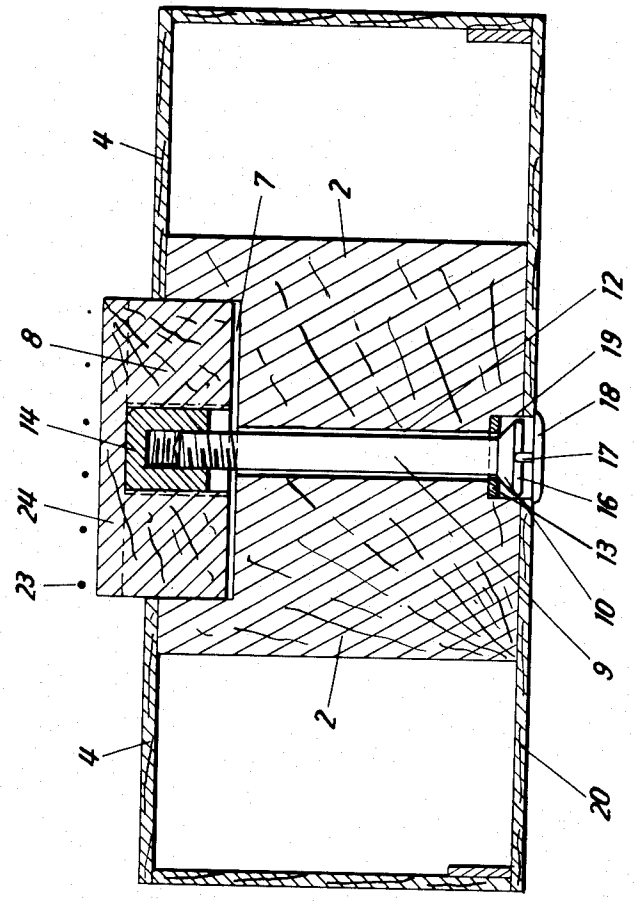
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Fig. 2



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Fig. 3

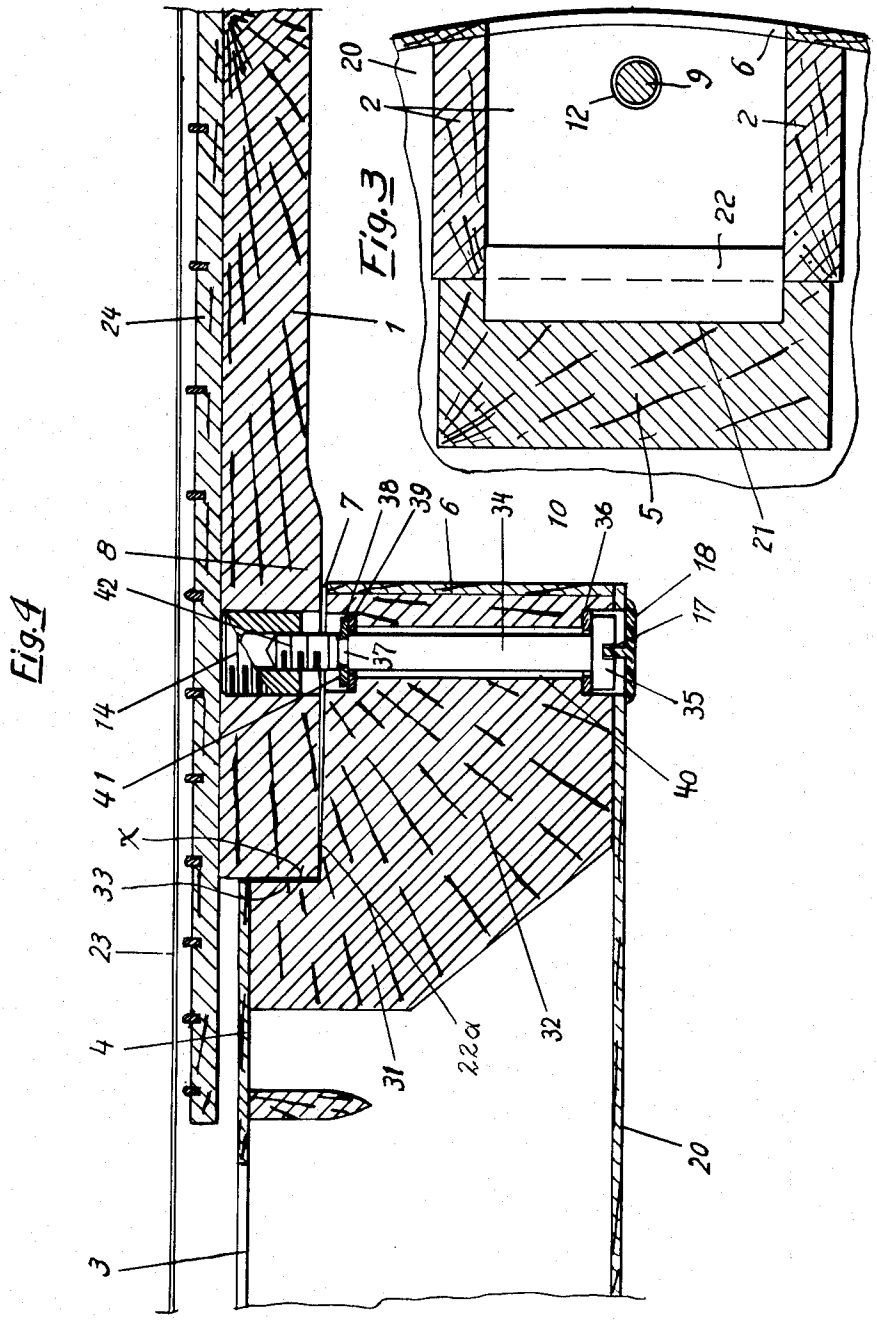


Fig. 4

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STRINGED INSTRUMENT

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10 Claims. (Cl. 84—291)

The invention relates to stringed instruments having elongate neck members along which the strings extend, and sounding boards to which the necks are attached.

An object of the invention is to provide an improved stringed instrument of the type having a sounding board, wherein the instrument neck is adjustable with respect to the sounding board and reliably mounted thereon in a simple manner without destroying the resonance characteristics of the sounding board. In valuable and expensive concert guitars efforts have been made to fasten the neck adjustably to the sounding board by alteration at the collar of the neck whereby the collar instead of being glued as usual to the frame of the sounding board, is attached thereto through a guiding and adjusting fastener. Aside from a material undesirable cost increase, this also had the disadvantage that the guiding and adjusting fastener made the playing more difficult particularly of the higher notes, because of its obstructing action.

The above drawback is obviated by the invention, and accordingly another object is to provide an improved stringed instrument with adjustable neck as above set forth, wherein the adjustable fastening is wholly contained in the sounding board and no obstruction is presented at the collar area. Instead, the space below the neck of the instrument, leading up to the frame of the sounding board is completely free and usable. At the same time, the adjustable fastening is particularly simple and inexpensive to produce.

The adjustable fastening as herein provided utilizes a notched arrangement and is in itself a very simple and favorable way of attaching the instrument neck adjustably to a supporting structure; but merely a simple notching could not as such be used for stringed instruments of the type having a sounding board because on the one hand it would not be strong enough and, on the other hand, it could conceivably impair the resonance properties of the sounding board and hence the sound of the instrument.

In accordance with the present invention, the little fastening stick which is in the interior of the sound board of every stringed instrument in the area of the connecting point of the sounding board and instrument neck and to which are fastened the sounding board bottom, the sounding board cover and the sounding board frame (connecting them with each other) is made to carry additionally at its front side, i.e. the side facing the sound hole, a support block for the neck. The block is fastened to the inside surface of the sounding board top or cover, while the lower portion of an extension of the neck is disposed in recesses of the fastening stick, the support block and the top or cover of the sounding board, being held there by means of an adjusting bolt. This results in a desirable internal adjustable attachment of the neck to the sounding board, which attachment is at least as good in its mechanical strength and its favorable adjustment possibilities as known external adjustable connections between the neck and board and which further, however, is found to improve rather than worsen the resonance properties of the sounding board and hence the sound quality of the instrument. By the invention, the neck collar which was necessary heretofore in all stringed instruments having a sounding board, i.e. instruments whose neck was not adjustably attached to the sounding board, and which raised the manufacturing cost for the neck considerably and constituted an obstruction in playing, particularly the higher

notes, is obviated. The space below the neck thus becomes free, leading right up to the sounding board frame.

The support block which is provided can be formed as a separate piece and firmly attached, as by gluing for example, to the front side of the small fastening stick. It is also possible to make the support block as an integral part of the fastening stick.

The adjusting bolt can be fastened in the instrument neck and act as both a draft means and a push means. Normally, however, it is sufficient to utilize the adjusting bolt solely as a draft means.

In one form of the invention the bottoms of the recesses in the support block and fastening stick can be formed so as to be a support table for the lower surface of the neck extension, while the adjusting bolt is arranged at the rear or outermost portion of the recess and passes through the fastening stick, its adjusting end being accessible through a hole in the sounding board bottom. In this form of the invention the neck is maintained in its position by the joint effect of the pull of the strings, the pressure of the undersurface of the neck against the table or supporting surface at the bottom of the recess in the support block and the fastening stick, and the pull provided by the bolt. This form of the invention is particularly suited for all instances where the neck has to be adjustable to a comparatively large degree.

For those instances in which only a comparatively small degree of adjustability is required, another form of the invention is particularly suitable in which the front face or inner end surface of the neck extension is firmly joined, as for instance glued, to the rear face of the recess in the fastening block.

Further advantages and features of the invention become evident from the following description of the two forms, taken in connection with the accompanying drawing, wherein:

FIG. 1 is a fragmentary longitudinal sectional view taken through the connecting point between the sounding board assemblage and instrument neck in one form of the invention.

FIG. 2 is a transverse section taken along the line 2—2 of FIG. 1.

FIG. 3 is a horizotnal section taken on the line 3—3 of FIG. 1.

FIG. 4 is a view like that of FIG. 1 but showing the second form of the invention.

The novel adjustable connection of an instrument neck with a sounding board as illustrated in both examples of the invention is particularly suited for concert guitars. However, the invention is not limited to concert guitars but instead can be applied in appropriate manner to all kinds of stringed instruments having sounding boards.

In the example according to FIGS. 1–3 the small fastening stick as illustrated at 2 and provided at the side of the instrument neck 1 is made stronger and larger than those in known guitars. By the invention it is attached to an additional piece, constituted as the support block 5 the attachment of the latter being made to that side of the small stick 2 which faces toward the sound hole 3 in the sounding board top or cover 4. In the illustrated example, support block 5 is rigidly connected as by gluing it to the little stick 2 and also to the underside of the sounding board cover 4.

However, it is also possible to make support block 5 as an integral part of the small stick 2, as will be later brought out in connection with the embodiment of FIG. 4. In the support block 5, the stick 2, the sounding board cover 4 and the frame 6 there are aligned recesses which together form a socket 7 into which the extension 8 of the neck 1 is disposed. The neck extension 8 is made to have the full width of the instrument neck 1 and

as seen in FIG. 1 has practically the same thickness as the actual neck proper.

As the adjusting element, an adjusting bolt 9 is provided, having a nut 14 which is secured against rotation and is mounted in the interior of the neck extension 8, being kept in its position by screw threads 11. The adjusting bolt 9 is arranged inside a vertical hole 12 through the stick 2. The hole 12 is surrounded at the bottom by a bearing plate or washer 13 against which the bolt head 10 rests. Besides the usual slot 16, the bolt head 10 is provided with a center hole 17 for the attachment of a closing cap 18 which has a central pin. The head 10 of the bolt 9 is accessible through a hole 19 in the bottom 20 of the sounding board assemblage.

The front or inner face 21 and the front portion 22 of the lower surface of the neck extension 8 can be rigidly attached, as for instance glued, in the portion of the sock 7 which is located in the support block 5. This results, when the bolt is adjusted, in only a rather limited range of movement which, however, suffices to adjust the neck 1. Thereby, the adjustment of the neck 1 is independent of the tension of the strings 23. If a greater adjustment range is desired, the neck extension 8, aside from the adjusting bolt 9, may remain unfastened in the socket 7. In this case, however, the bottom of the socket 7 is equipped with a bearing plate 22*a* in the support block 5, to engage the lower portion of the neck extension.

In FIG. 4, all those parts which in this second form of the invention are the same as the corresponding parts in the form according to FIGS. 1–3 have the same reference numbers as in FIGS. 1–3.

According to FIG. 4, the additional support block is numbered 31, and is an integral part of the small fastening stick 32 disposed at the locale of the instrument neck 1 in the interior of the sounding board assemblage. Both parts are made of the same piece of wood. The front face or inner end *x* of the instrument neck 1 is glued to the face surface 33 of the recess in the support block 31 and fastening stick 32, and in this way it is firmly connected to the support block 31 and stick 32.

In this example of the invention, the adjusting bolt 34 is arranged to be both a draft and also a push means. As a draft bolt it acts through the head 35 and a bearing plate 36 which simultaneously prevents involuntary axial movement of the bolt in the fastening stick 32. As a push screw, the adjusting bolt 34 acts on the fastening stick 32 via an annular groove 37 in the bolt and a snap ring 38 inserted in the groove and which rests on a second bearing plate 39. The second bearing plate 39 at the same time prevents the adjusting bolt from axial shifting when it is used as a push means. The hole 40 in the fastening stick 32, therefore, has an upper cylindrical enlargement 41 which receives both the second bearing plate 39 and the snap ring 38.

In both cases, i.e. as a draw bolt and as a push screw, the adjusting bolt 34 acts on the instrument neck 1 via its thread 42 and the nut 14 which latter is screwed into the neck extension 8.

Besides the illustrated examples, further changes and modifications are possible within the concept of the invention. For instance, in both illustrated examples the adjusting bolt 9 or 34 respectively is seen to be inserted from below into the holes 12 or 40 respectively in the fastening sticks 2 or 32, and the nut 14 is fastened in the neck extension 8. But it is also possible to attach the head of the adjusting bolt, secured against axial movement, in the neck extension 8 and to cover it by the finger board 24, while a sleeve-shaped nut located in the holes 12 or 40 respectively in the fastening sticks 2 or 32 is screwed from below onto the bolt 9 to act as the adjusting member. Likewise, modifications and changes in the construction of the fastening sticks 2 or 32, in the support blocks 5 or 31 and in their upper recesses which receive the neck extension 8 are also possible..

The extension 8 and the neck 7 are of substantially the same width, and the underside of the extension is substantially planar as shown. Also, the surfaces of the blocks 2 and 5 which are opposite the planar underside of the extension are also substantially planar.

The constructions shown have the advantage that twisting stress to which the fastening block or stick 2 may be subjected is reduced, and this is effected because the inner fulcruming end of the extension 8, at the surface 21, is disposed a substantial distance beyond and inwardly of the inner surface of the fastening block or stick 2. It will also be noted that major areas of the underside of the extension and of the opposite planar surfaces of the fastening stick are spaced apart, to allow for the adjustment as effected by the screw 9.

I claim:

1. A stringed instrument comprising, in combination:
(a) a sounding board assemblage, said assemblage including:
(1) a sounding board cover,
(2) a sounding board frame to which the cover is attached,
(b) an instrument neck having an extension adapted for attachment to the sounding board assemblage, said extension having an inner face which faces away from the remote end of the neck and having an underside and adjoining side surfaces disposed outwardly of said inner face,
(c) a fastening stick within the sounding board assemblage, attached to the sounding board cover, frame and bottom at the location of the instrument neck,
(d) a support block fastened to the inside surface of the sounding board cover and to the front side of the fastening stick,
(e) said support block, fastening stick and sounding board cover having aligned recesses constituting a socket in which the extension of the instrument neck is disposed, said socket being characterized by a front face surface and adjoining bottom and opposite side surfaces,
(f) means for securing the instrument neck extension in said socket,
(g) the inner face of the instrument neck extension engaging the front face surface of said socket with the side surfaces of the socket and neck extension respectively in opposed relation to each other,
(h) the underside of the neck extension being spaced from the bottom surface of the socket at the location of the sounding board frame to render the neck extension independent of variations of the said frame,

2. A stringed instrument as in claim 1, wherein:
(a) an inwardly located bearing surface is provided in the bottom of said socket, for engagement with the underside of the neck extension,
(b) an adjusting bolt for the instrument neck, said bolt being secured to said neck and being disposed at the outer portion of the socket and passing through the fastening stick,
(c) said sounding board bottom having a hole through which the adjusting end of the adjusting bolt is accessible.

3. A stringed instrument as in claim 2, wherein:
(a) the recess in the support block has a rear surface,
(b) means are provided, rigidly securing the inner face of the neck extension to said rear surface.

4. A stringed instrument as in claim 2, wherein:
(a) a bearing plate is carried by the fastening stick at its lower portion,
(b) said adjustment bolt passing through the bearing plate and constituting a tensile means for exerting a pulling force on the instrument neck when the bolt is turned in one direction.

5. A stringed instrument as in claim 4, wherein:
(a) a second bearing plate is provided on the upper portion of the fastening stick, through which the adjustment bolt passes,

(b) said bolt having an annular groove and a snap ring in the groove,

(c) said ring bearing against the second bearing plate and enabling the bolt when turned in a reverse direction, to exert a pushing force on the instrument neck.

6. A stringed instrument as in claim **1**, wherein:

(a) said support block comprises a piece separate from the fastening stick and rigidly secured thereto.

7. A stringed instrument as in claim **1**, wherein:

(a) the neck extension and the instrument neck are of substantially the same width, and

(b) the fastening stick is wider than the instrument neck.

8. A stringed instrument as in claim **7**, wherein:

(a) the neck extension has a planar underside and the bottom surface of the socket is planar and spaced from the underside of the extension for a major portion of its area.

9. A stringed instrument as in claim **1**, wherein:

(a) the support block and fastening stick are one piece and integral with each other.

10. A stringed instrument comprising, in combination:

(a) a marginal, contoured frame of sheet material having elongate opposite edges, said frame being disposed edgewise to the instrument strings and having a contour such that it in part defines an enclosure,

(b) a top cover member of sheet material secured to one edge of the frame,

(c) a bottom cover member of sheet material secured to the other edge of the frame, said frame and cover members constituting a sound box and enclosing a space adjoining the instrument strings,

(d) an edge portion of the frame and an adjoining peripheral portion of the top cover member having juxtaposed and aligned notches,

(e) a fastening block disposed within the sound box, having a notch aligned with the said notches of the frame and top cover member,

(f) said fastening block being rigidly secured to the frame and to both the top and bottom cover members,

(g) a support block disposed within the sound box,

(h) said support block being rigidly carried by an inner side of the fastening block and rigidly secured to the top cover member,

(i) said support block having a notch aligned with the notches of the fastening block, top cover member and marginal frame,

(j) an instrument neck having an extension adapted for attachment to the assemblage of top and bottom cover members, marginal frame, and fastening and support blocks,

(k) said extension being disposed in the said aligned notches,

(l) a fastening screw passing through the fastening block,

(m) a nut embedded in and fastened to the extension, in which nut the screw is threaded,

(n) said nut having external threads and being threaded thereby into the extension,

(o) spaced shoulders on the screw, between which portions of the fastening block are disposed, preventing axial movement of the screw,

(p) the inner end of the extension abutting a surface of the notch in the support block, which surface is substantially in parallelism with a portion of the frame,

(q) a bearing plate between the lower surface of the extension and the adjoining surfaces of the support block, said bearing plate constituting a fulcrum,

(r) an engaging end surface of the extension and rear surface of the support block located above the bearing plate being glued together,

(s) the fastening block having a through opening adjacent the frame, through which the screw passes,

(t) said bottom cover having a hole through which the screw is accessible,

(u) said fastening block having bearing plates engaged with the shoulders of the screw,

(v) said screw constituting either a push or a pull means acting on the extension, depending on the direction of turning of the screw,

(w) the extension having a planar underside,

(x) the surfaces of the blocks which are opposite the planar underside of the extension being substantially planar,

(y) the said engaging end surface of the extension being disposed a distance beyond and inwardly of the inner surface of the fastening block to reduce the twisting stress to which the said block is subjected,

(z) major areas of the underside of the extension and opposite planar surface of the fastening block being spaced apart.

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