Jan. 31, 1939. G. EBERHART 2,145,237

SOUND POST

Filed Sept. 7, 1937

Fig. 1.

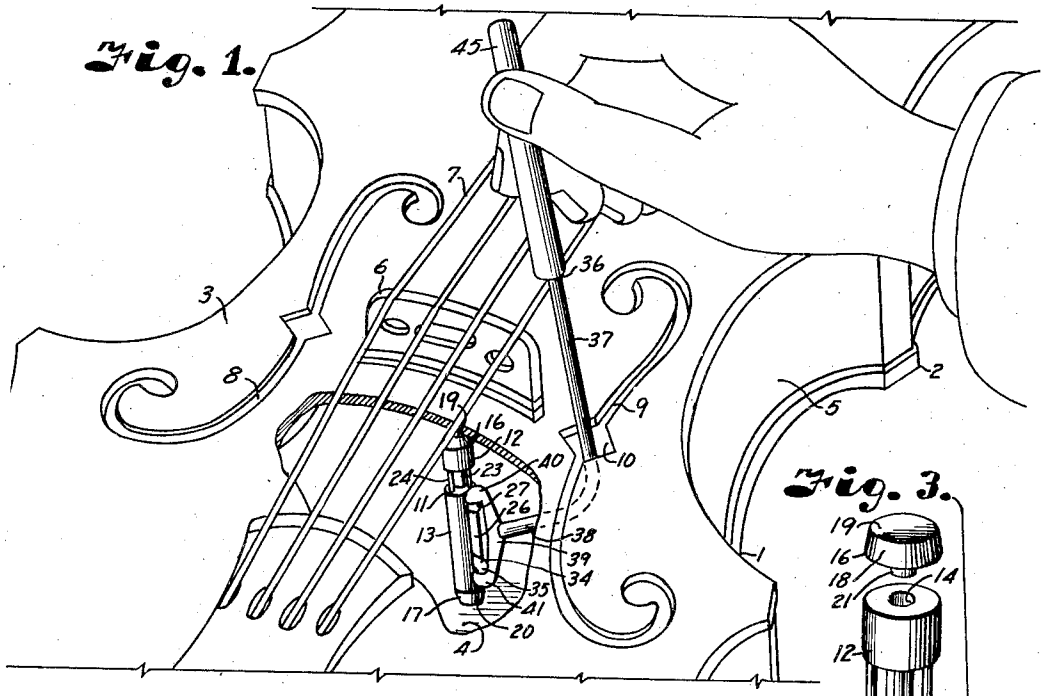


Fig. 3.

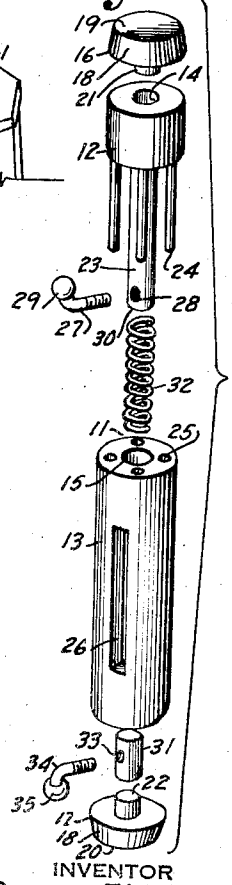


Fig. 2.

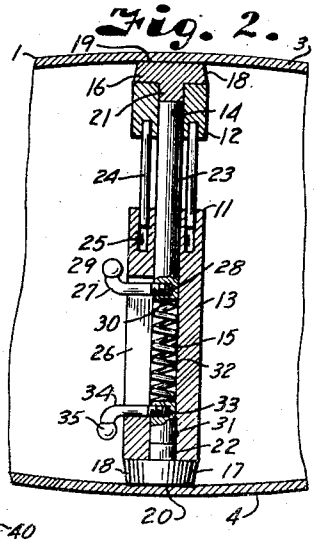
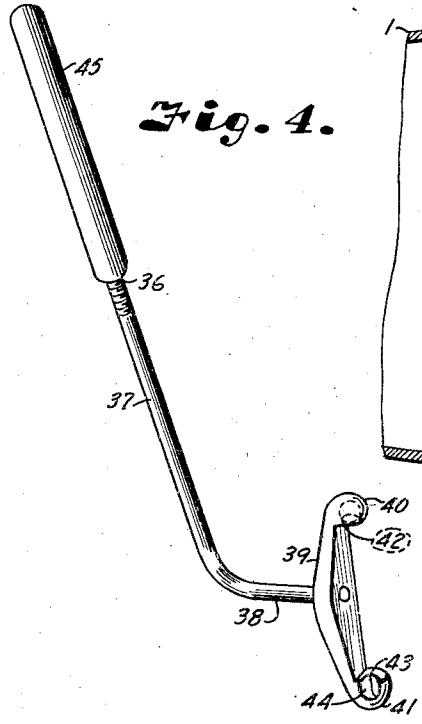


Fig. 4.



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2,145,237

SOUND POST

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11 Claims. (Cl. 84—277)

This invention relates to violins and similar musical instruments which are provided with sound posts to support the belly or front side and transmit sound vibrations to the back or under side of the sound body. The sound post usually consists of a single piece, corresponding in length with the spacing between the belly and back of the sound body where the sound post produces the best effect. Since the location of the post must be found through fit and try methods, it is difficult to cut the post so that the length thereof will be such as to afford the proper support. This is particularly obvious when it is considered that the length of the post varies with its location in the sound body. For example, a post suitable for one location is not adapted for a position even slightly offset therefrom. Even should the exact location of the sound post be known, it is difficult to measure the required length for the reason that the only access to the point of location is through the sound openings. If the post is cut too long it places undue strain upon the sound body, causing it to split, or it affects the tone quality; likewise if the post is too short it will not provide the required support and it is apt to shift out of position. I am aware that sound posts have been constructed of telescoping parts to avoid some of the objections, particularly variation in length, but the posts are not constructed so that they may be readily shifted about within the sound body in locating their most efficient position.

It is, therefore, the principal object of the present invention to provide a sound post construction that permits ready adaptation to the place of location where it is found to be most efficient.

It is also an object of the present invention to provide a sound post of this character with tool engaging means so that it is readily engaged and disengaged with a locating tool.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a violin equipped with a sound post embodying the features of the present invention, and showing the tool whereby the sound post is readily shifted to find its proper position within the sound body.

Fig. 2 is an enlarged detail section through the sound post and the engaged portions of the sound body.

Fig. 3 is a detail perspective view of the parts of the sound post, shown in disassembled spaced relation to better illustrate their construction.

Fig. 4 is a detail perspective view of the inserting tool.

Referring more in detail to the drawing:

1 designates an ordinary violin including a hollow wooden body 2, comprising a belly or upper side 3, a back or under side 4, and connecting walls 5. The sides 3 and 4 are arched outwardly in both longitudinal and transverse directions, so that the spacing varies therebetween throughout their entire area. The belly 3 is provided with the usual bridge 6, over which the strings 7 are drawn, as in conventional violin construction. The belly 3 is further provided with substantially S-shaped sound openings or slots 8 and 9 on the respective sides of the bridge. The sound openings are relatively narrow and are provided with slightly enlarged portions 10, substantially aligning with the bridge, to permit insertion of a sound post 11.

The usual location for the sound post 11 is approximately within the center of the sound body and offset slightly from the bridge. At this point the length of the sound post is critical due to the arch in the upper and lower sides of the sound body. Since the sound post must be installed after the violin has been constructed, it is difficult to measure even the approximate length of the post required, for the reason that all measurements must be taken through one or the other of the sound openings and these are offset relatively to the point at which the sound post is to be located. As above pointed out, if the sound post is too short, it will not give the desired support, resulting in poor quality of tone, and if the post is too long it may cause splitting of the sound body, particularly if it is located adjacent the part weakened by provision of the sound openings.

In carrying out my invention, I therefore provide a sound post structure which is capable of compensating for variation in length according to its location within the sound body. The sound post 11 includes upper and lower cylindrical sections 12 and 13 having axial bores 14 and 15. The outer ends of the bores are closed by buttons 16 and 17 that are formed of suitable material to provide frictional engagement with the inner surfaces of the upper and lower sides of the sound body. The buttons 16 and 17 conform to the diameter of the sections 12 and 13 and have their peripheries slightly bevelled, as at 18, in the direction of their seating surfaces 19 and 20. The buttons 16 and 17 include shanks 21 and 22

that are adapted to be cemented or otherwise secured within the outer ends of the bores 14 and 15 respectively. Similarly engaged within the bore 14 of the section 12, and projecting downwardly therefrom, is a guide rod 23 having sliding bearing within the bore 15 of the section 13, as shown in Fig. 2, to retain the sections in axial alignment with each other. Cooperating with the rod 23 is a series of pins 24 that are carried by the section 12, in radially spaced relation with the rod 23, to slidably engage in corresponding bores 25 provided in the upper end of the section 13. The pins 24 thus provide additional contact between the sections 12 and 13 to prevent relative rotation of the sections and to provide greater transmission of sound vibrations between the respective sections so that substantially all of the movement in the upper side of the sound body is transmitted through the post to the lower side.

Formed in the side of the section 13 is a longitudinal slot 26, intersecting the bore 15 to accommodate a pin 27 that is extended through the slot 26 and engaged with a threaded opening 28 adjacent the end of the rod 23. The outer end of the pin terminates in a ball shaped head 29 that is adapted to be engaged by an inserting tool, later described. Inserted within the bore 15, and having one end engaged against the lower end 30 of the rod 23 and its opposite end against an insert 31, is a coil spring 32. The insert 31 closely engages within the lower end of the bore 15 and is retained therein by the button 17. The insert 31 is provided with a threaded bore 33 aligning with the slot 26, and threaded therein is a pin 34 projecting outwardly through the slot 26 and which carries a ball shaped head 35 corresponding to the head 29 of the pin 27, previously described.

With the sound post assembled as described, the spring 28, acting against the ends of the rod 23 and insert 31, spreads the sections 12 and 13 apart as limited by the pin 27 engaging the upper end of the slot 26, so that the over-all length of the post is slightly longer than the maximum spacing between the upper and lower sides of the sound body. The normal spacing between the sections 12 and 13 is also such as to allow sufficient compression of the spring 32 to adapt the length of the post to its point of location within the sound body. The resiliency of the spring 32 is such that when the post is inserted the buttons 16 and 17 will be held in firm contact with the inner surfaces of the upper and lower sides of the sound body so that sound vibrations are transmitted through the respective sections 12 and 13 by way of the pins 24 and rod 23 to give the desired tone quality.

In placing the sound post constructed as described, I employ an insert tool 36 which includes a rod-like shank 37, having a laterally extending terminal 38 carrying a yoke-shaped head 39 having laterally extending ears 40 and 41 provided with facing sockets 42 and 43, substantially corresponding in curvature to the ball shaped heads 29 and 35 of the pins 27 and 24 respectively. One of the sockets, for example, the socket 43, is provided with a side opening or notch 44 wherethrough the head 35 may be disengaged from the socket 43 by applying a slightly lateral pressure through the shank 37, as later described. The spacing between the sockets 42 and 43 is less than the normal spacing between the heads 29 and 35 so that the spring 32 is compressed and the total length of the sound post is less than the minimum spacing between the upper and lower sides of the sound body at the enlarged portions of the sound openings.

The opposite end of the shank 37 carries a suitable handle 45, whereby the tool may be readily manipulated in inserting the sound post.

In applying the sound post to the tool, the ends thereof are compressed between the thumb and forefinger of the hand so that the ball-shaped heads 29 and 35 will engage within the sockets 42 and 43 of the tool. When thus engaged the yoke-shaped head of the tool will retain the spring in compressed condition so that the total length of the sound post will permit its entrance through the enlarged portion of the sound slot. The head of the tool carrying the sound post 11 will readily pass through the enlarged portion of the sound opening when the lateral terminal 38 of the tool is parallel with the slotted portion of the sound opening at one or the other sides of the enlargement. When the sound post, including the head of the tool, has passed into the interior of the sound body, the tool may be slightly rotated to bring the post into approximate position relatively to the bridge, as shown in Fig. 1. In this position the shank 37 will probably enter the enlarged portion of the sound opening. The tool may then be disengaged from the post by exerting slight downward pressure thereon to effect slight compression of the spring 32, whereupon the handle is rocked with the upper ball shaped head 29 as a pivot to effect disengagement of the lower ball shaped head 35 from its seat 43, the opening 44 permitting passing of the head. Upon release of the compressing pressure, the upper section 12 is urged by the spring into seating contact with the upper side of the violin. After release the tool is removed through the sound opening. The violin is then tested for tone quality and if it is found that the sound post is not in the proper location, the tool may be readily reapplied by engaging the socket 42 with the ball shaped head 29, and applying slight downward pressure thereon to compress the spring sufficiently so that the lower socket 43 may be engaged with the lower ball shaped head 35, whereupon the sound post is shifted slightly, after which it is released as above described and the tool removed to permit testing of the violin. The post may thus be readily engaged for shifting its position, and disengaged to permit removal of the tool for other tests, until the proper location has been determined.

From the foregoing, it is apparent that I have provided a sound post which is readily adjusted to its position in a sound body and which compensates for variation in length due to curvature of the portions of the sound body engaged thereby. The action of the spring 32, while being firm enough to transmit the desired sound vibrations through the post, is not sufficient to cause damage to the sound body as in the instance of a solid post. The post construction also results in improvement of tone quality and volume of the musical instrument.

What I claim and desire to secure by Letters Patent is:

1. A sound post including a pair of aligning sections, means slidably connecting the sections in axial alignment, compression means normally urging the sections apart, and tool engaging members carried by the respective sections.

2. A sound post including a pair of aligning sections, means slidably connecting the sections in axial alignment, a spring urging the sections apart, and tool engaging members carried by the respective sections.

3. A sound post including a pair of axially aligned sections, one movable relatively to the other, guide means on one of the sections and slidably engaged with the other section to guidingly retain the sections in axial alignment, a spring normally urging the sections apart, and tool engaging members carried by the respective sections.

4. A sound post including a pair of sections, one of said sections having an axial bore, a guide on the other section and slidable in said bore, a spring in said bore for urging the sections apart, and tool engaging members carried by the respective sections.

5. A sound post including a pair of sections having aligning bores, a guide rod fixed in the bore of one section and slidably engaged in the bore of the other section, said other section having a slot intersecting the bore, an insert in said bore of said slotted section, tool engaging members on said guide rod and insert and projecting through said slot, and compression means between the guide rod and the insert for normally spreading the sections.

6. A sound post including a pair of sections having aligning bores, a guide rod fixed in the bore of one section and slidably engaged in the bore of the other section, said other section having a slot intersecting the bore, an insert in said bore of said slotted section, tool engaging members on said guide rod and insert and projecting through said slot, and a spring engageable between the guide rod and the insert for normally spreading the sections.

7. A sound post including a pair of sections having aligning bores, a guide rod fixed in the bore of one section and slidably engaged in the bore of the other section, said other section having a slot intersecting the bore, an insert in said bore of said slotted section, tool engaging members on said guide rod and insert and projecting through said slot, a spring engageable between the guide rod and the insert for normally spreading the sections, and buttons closing the outer ends of the bores.

8. A sound post including a pair of axially aligned sections, means movably connecting the sections one with respect to the other, a spring engaging between said sections, and tool engaging members extending laterally from one side of the respective sections.

9. A sound post including a pair of sections, one of said sections having an axial bore and guide pin engaging portions, a guide rod on the other section and slidable in said bore, guide pins on said other section radially spaced from the guide rod to engage said guide portions, and compression means in the bore for normally urging the sections apart.

10. A sound post including a pair of sections having aligning bores and guide pin engaging portions spaced radially from said bores, a guide rod fixed in the bore of one section and slidably engaged in the bore of the other section, guide pins engaged in said portions, a spring engageable with the guide rod for normally spreading the sections, and buttons closing the outer ends of the bores.

11. A sound post having spaced pins extending laterally therefrom on one side of said post and provided with substantially ball-shaped terminals.

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