March 14, 1939. H. S. BRAMAN 2,150,736

STRINGED INSTRUMENT BODY

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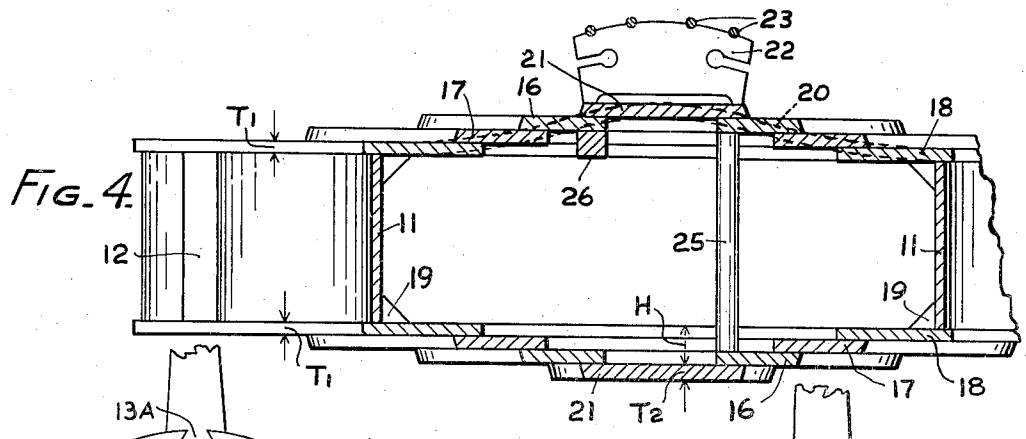


FIG. 4.

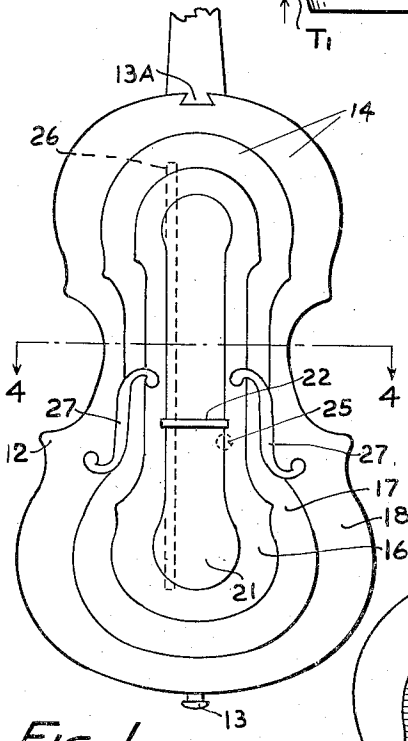


FIG. 1.

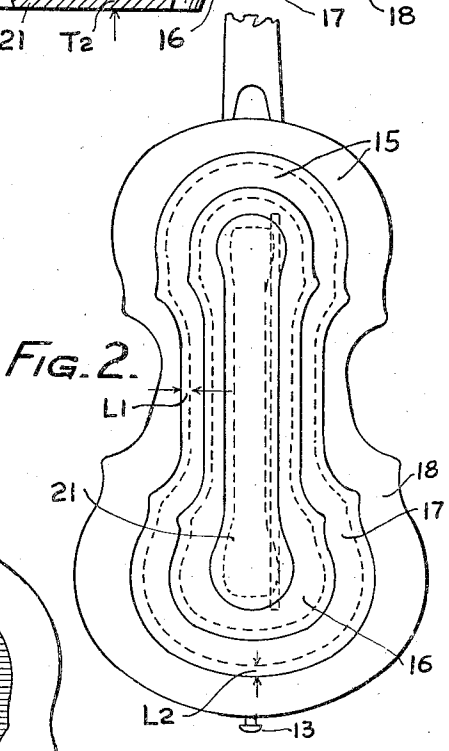


FIG. 2.

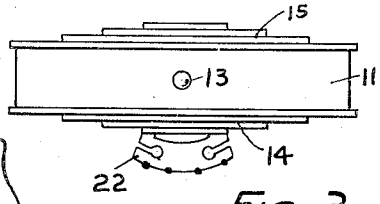


FIG. 3.

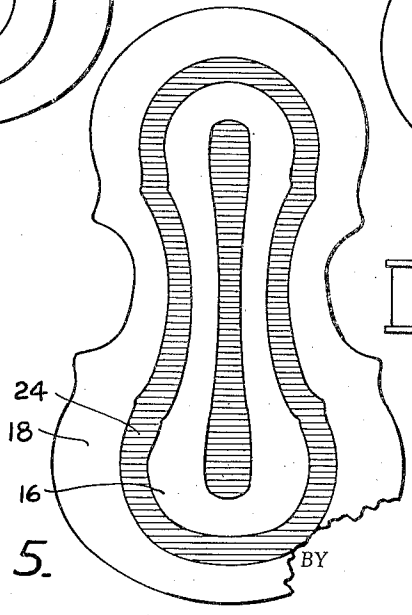


FIG. 5.

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STRINGED INSTRUMENT BODY

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Application October 20, 1937, Serial No. 170,019

4 Claims. (Cl. 84—275)

This invention pertains to stringed musical instruments and more particularly relates to improvements in the fabrication of a violin, viola, violoncello or the like viol class that are played by means of a bow.

The shaping of a violin and analogous instruments is inherently difficult to reproduce precisely and ordinarily is accomplished only with a high degree of perfection by a master workman. In such connection, the body structure exerts a controlling influence to make it properly responsive to string vibrations. The instant contribution to the art strives to provide a highly efficient instrument that shall possess a rich and colorful tone. Resort is herein had to novel laminated sounding board means such as a well seasoned wooden belly and back. Each such board may comprise a series of superimposed annularly shaped plies in stepped perimetric sizes that are kept planiform when stacked and cemented together. The respective marginal ply edges are purposely overlapped and the center region closed by a crown plate to build up a unitary interiorly warped sounding board having an arched cross-sectional profile without need of gouging out a solid wooden slab or requiring prolonged scraping when accurately finishing the same to a given exemplar.

In order to conform with best violin practice and provide for proper proportions to attain a fine tone quality, the dished medial region of such similarly breasted belly and back members are commonly made considerably thicker than the more distant perimetric region thereof. In the present innovation, a corresponding gradation or equivalent board thickness is preferably obtained by more closely spacing the doubled overlapping edges of planiform wood plies that respectively have a uniform thickness; also when desired, by increasing the relative thickness of the plies located toward the medial region of my front and back sounding boards. Such simulated concavo-convex profile extends axially lengthwise and also crosswise of my instrument. Each of my flat annular ply components may be stamped up and exactly duplicated by die means or otherwise cut out of suitable acoustically good, flat board stock by the use of ordinary wood working machinery on a lost cost productive basis without the exacting care that is ordinarily required in fabricating a high breasted back or belly by hand methods.

The outer endless contour of the respective plies in each head generally follows the lobed face shape of the instrument to which they are applied and are relatively inset and securely cemented together in an appropriate manner. Each belly and back member of the instrument is preferably provided with the same number of overlapping ring-shaped plies so that my sounding boards will possess like resonant characteristics and vibrate in exact unison. Two or more ringlike planiform plies per board usually suffice for smaller instruments, the opening in the inner ply being closed by a flat crown plate to complete a belly or back. Old violins in need of sounding board replacement, can readily be repaired by the laminated feature herein taught.

The object of my improvements is to provide for a simple belly or back structure of the kind indicated whose carpentry is inherently easy to execute in quantity production and that can be economically duplicated to meet exacting gauge specifications for various proven models of different form and sizes of stringed instruments.

Reference is had to the accompanying one sheet of drawings which is illustrative of a preferred embodiment, and in which:

Fig. 1 represents a front face view of a stripped violin body of which the belly is equipped with my improved devices, and Fig. 2 illustrates a rear face or back view thereof.

Fig. 3 is a tail end view of such body, and Fig. 4 shows in somewhat exaggerated scale and wall thickness, a cross-sectional view taken along the transverse line 4—4 of Fig. 1 to depict the reversely arched profiles of my belly and back members.

Fig. 5 details the contour that may be given to certain annularly shaped laminations herein used to build up a warped sounding board.

Referring more specifically to the drawing, my instrument includes a violin body which for sake of clarity, is shown devoid of the usual trimmings such as a neck, finger board, tail piece and the like appurtenances. Said body may comprise the conventional endless side wall 11 of uniform thickness and height having a bipartite lobed contour of which the contracted medial region may be fortified with inset bout blocks such as 12. The usual tail pin is designated as 13 and the neck receiving dovetail as 13A.

Spanningly mounted upon the respective opposite edges of said side wall, is a unitary belly 14 and a unitary back 15 serving as reversely arched sounding boards of which the respective linings may be cemented in place by reenforcing strips 19 in the Fig. 4 manner. Each such body board is herein built up to comprise a symmetrically disposed stack of two or more relatively thin plani-

form and annularly shaped plies such as the similar patterns 16, 17 and 18, respectively having stepped or successively overlapping outer perimetric edges that may approximately conform in shape to that of the side wall contour, as shown. The inner marginal edge of each such elongated ply is indicated by dotted outline in Fig. 2 as 16', 17' and 18'. In the appended claims, the term "planiform" is used in the sense that each component ply is kept substantially uniform in thickness to comprise opposed truly flat side faces respectively lying in planes that are devoid of superficial curvature or initial warpage after being operatively installed in place as sounding board constituents.

Both the relative thickness of the respective plies and their degree of overlap may be altered within reasonable limits. For best results, denser plies are made relatively thinner than for lighter woods. An effect may thereby be attained substantially equivalent to that afforded by a more gradually thickened sounding board of the conventional solid breasted type whose profile continuously increases toward the center region thereof as indicated in dotted lines as 20.

A striplike crown ply 21 of equal or of augmented thickness, overlappingly spans the central opening of the inner annular ply 16. By increasing the relatively wide lap or rib L1 of Fig. 2 in each board with respect to the narrower lap or rib L2 located at the ply ends, a virtual thickening of both the belly and back may be achieved at their contracted medial or minor axis region, although all component plies are kept to an identical flat stock thickness. The same objective may also be reached by resort to a differential thickness T2 when made greater than T1 (see Fig. 4). In either case, such ribbed belly is materially stiffened under the upright bridge 22 to properly counteract the lateral thrust of the tensioned strings 23 and also to strengthen the boards against collapse when inadvertently pressed inwardly during rough handling. It is preferred to run the wood grain in all board plies axially lengthwise of the body but said grain may also be differently directed or arranged. By the use of separately formed plies, there is less tendency for an insufficiently seasoned sounding board to become alignedly cracked with age through several of its plies so as to extend axially throughout the body length.

My cross-sectionally arched boards 14 and 15 may or may not be slightly sprung in place while being glued to their side wall 11. As shown, such completed instrument is further provided with a sound post 25 whose proper construction and location with respect to a bridge foot is of importance in transmitting coordinated vibration between these sounding boards. As detailed in Fig. 4, such post is preferably inserted between corresponding plies such as 16. In addition, the belly interior is also equipped with a longitudinal bass bar 26 of conventional design.

As will be understood, said belly has a pair of "f" shaped sound holes such as 27 cut therethrough closely contiguous to the respective bridge ends. The several belly ply laps such as L1 may be extended to compensate in part for the weakened hole region. The height of the side wall 11 is held to a dimension that will entrap a measured volume of air content to control sound intensity and otherwise satisfy the needs of an instrument of a given form and size.

It is further emphasized that the arched profiles for both the belly and the back, exert a marked influence upon performance and tone quality of my instrument, also that the mere lamination of boards without such reversely concaved interior surfaces and carefully selected gradation in stepped ribbed thickness, is far less likely to produce a superior violin possessing inherent mellowness and beauty of tone. The arched rise H (see Fig. 4) of my breasted head profile may by the present laminated structure, be given a considerable magnitude.

Fig. 5 shows the manner in which several ring shaped plies such as 16 and 18 may be simultaneously stamped out of planiform board stock, the perimeters of the different potential plies being preferably sized to leave a small endless spacing 24 therebetween so as to utilize such stock to the best advantage. If desired, the exposed edges of the built up plies may be beveled into a merged outer or inner sounding board surface. However, the violin or cello as detailed in the drawing presents an attractively neat and ornamental appearance and which by extended tests, has been found to produce a high quality stringed instrument at a comparatively low productive cost.

The preceding disclosure will it is believed, make apparent to those skilled in the violin making art, the resulting advantages afforded by my simplified mode of sounding board fabrication. While the present specification has primarily been directed to a particular type of lamination, this is not intended to imply a corresponding restriction in the wider application of its underlying structural principle, it being understood that various changes in such illustrative embodiment may be resorted to without departing from the spirit and scope of my invention heretofore described and more particularly pointed out in the appended claims.

I claim:

1. In a musical instrument of the viol class, a body member provided with an annular side wall and a laminated sounding board having plies cemented together and spanningly secured to one endless wall edge, said board comprising a centrally disposed flat crown ply having an elongated shape whose width straddles the long axis of the instrument and whose perimeter is relatively small with respect to the endless contour of said one edge, there being a plurality of truly flat plies interposed between the crown ply and the aforesaid edge and which plies are respectively similarly shaped into patterns of stepped perimetric sizes stacked in planiform relation with certain outer and inner ply perimeters arranged in overlapping relationship whereby to impart a simulated cross-sectionally arched profile to said sounding board that is virtually the equivalent in purpose to a breasted non-laminated sounding board of which the profile continuously increases in thickness toward the center region thereof.

2. In a musical instrument of the viol class, a body member provided with an endless side wall of which the opposite edges respectively have an arched wooden sounding board spanningly secured thereto to constitute a built-up breasted belly and a like back member that are reversely mounted, each such sounding board comprising a stack of planiform laminations cut from relatively thin flat stock of which two or more such component plies are similarly shaped into elongated annular patterns in stepped perimetric sizes that are stacked in planiform relation with certain of their respective outer and inner perimeters arranged to overlap and the central opening of

which smallest pattern is closed by an elongated crown ply, the several planiform plies contained in each such sounding board remaining flat and being symmetrically assembled to straddle the long axis of the instrument and cemented together to provide for a cross-sectionally arched profile.

3. In a musical instrument of the viol class, a body member provided with an endless side wall of which opposite edges respectively have a built-up cross-sectionally arched wooden sounding board spanningly secured thereto, each such board comprising planiform laminations adapted to be cut from relatively thin flat stock of which two or more of such component plies are similarly shaped into elongated annular patterns in stepped perimetric sizes that are stacked in planiform relation with certain of their respective outer and inner perimeters arranged to overlap and the central opening of which smaller pattern is closed by a crown ply, the ply overlap in the region of the short axis of several plies being augmented with respect to the ply overlap in the region of the long axis thereof and the plies contained in each such sounding board being symmetrically assembled and cemented together to constitute a breasted belly and a like back member whose respective arched profiles are reversely mounted.

4. In a musical instrument of the viol class, a body member provided with an endless side wall of which opposite edges respectively have a built-up cross-sectionally arched wooden sounding board spanningly secured thereto, each such board comprising planiform laminations adapted to be cut from relatively thin flat stock of which two or more of such component plies are similarly shaped into elongated annular patterns in stepped perimetric sizes and stacked in planiform relation with certain of their respective outer and inner perimeters arranged to overlap relation and the central opening of which smallest pattern is closed by a crown ply, the largest ply being kept relatively thin with respect to said crown ply and the several plies contained in each such sounding board being symmetrically assembled and cemented together to constitute a breasted belly and a like back member whose respective arched profiles are reversely mounted.

HARRY S. BRAMAN.