F. M. ASHLEY.

VIOLIN.

APPLICATION FILED JUNE 17, 1914.

1,208,077.

Patented Dec. 12, 1916.

3 SHEETS—SHEET 1.

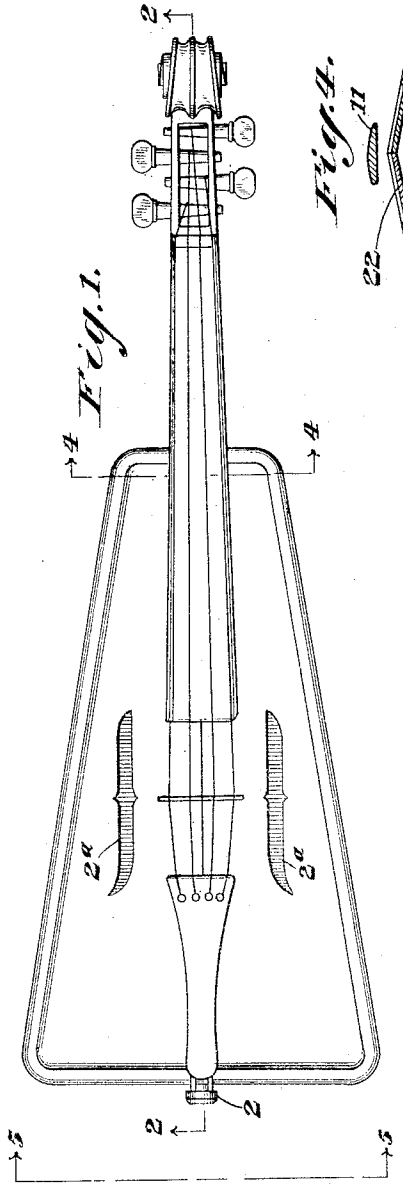


Fig. 1.

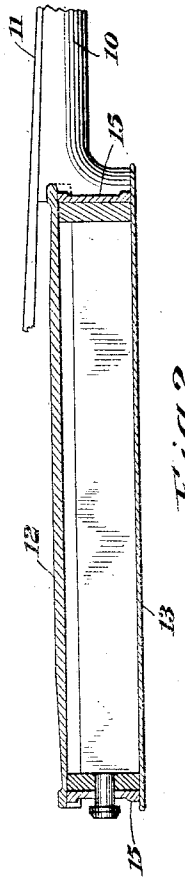


Fig. 2.

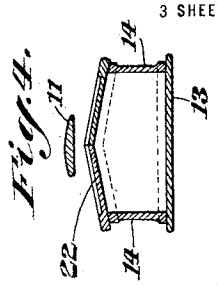


Fig. 4.

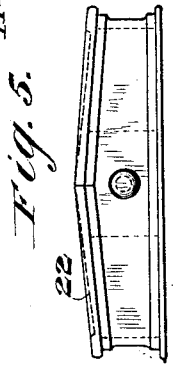


Fig. 5.

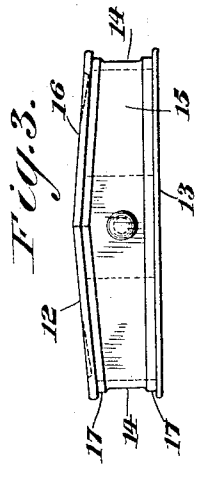


Fig. 3.

WITNESSES

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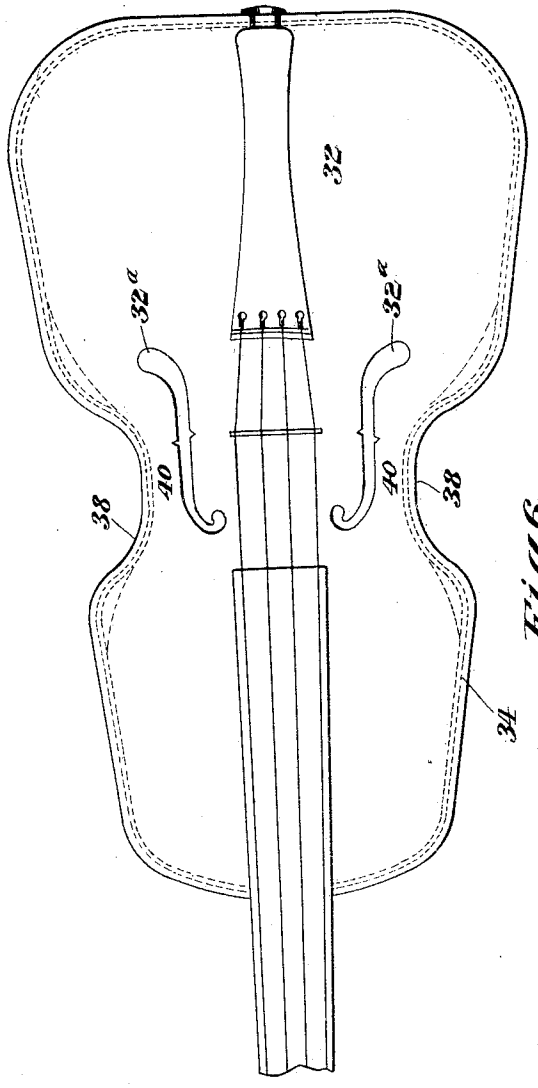


Fig. 6.

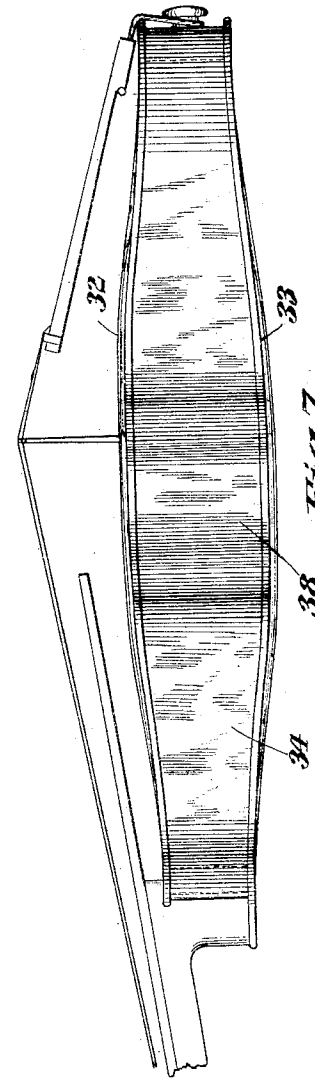


Fig. 7.

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3 SHEETS—SHEET 3.

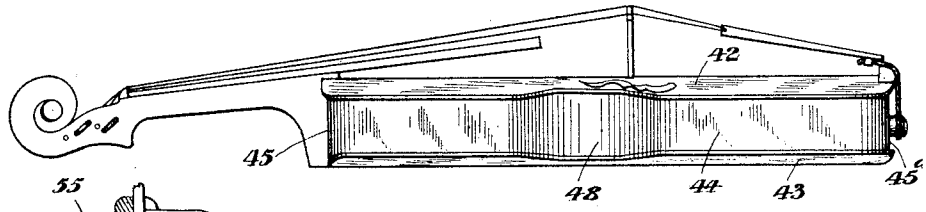


Fig. 8.

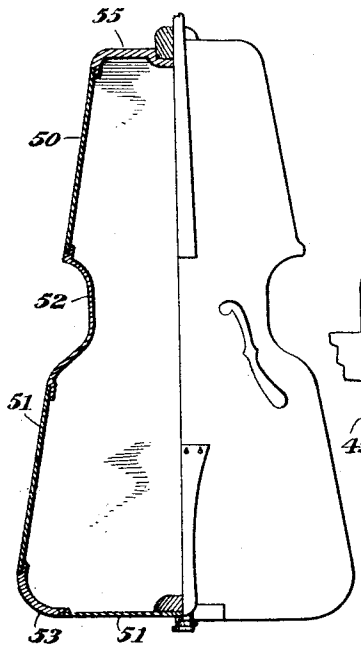


Fig. 12.

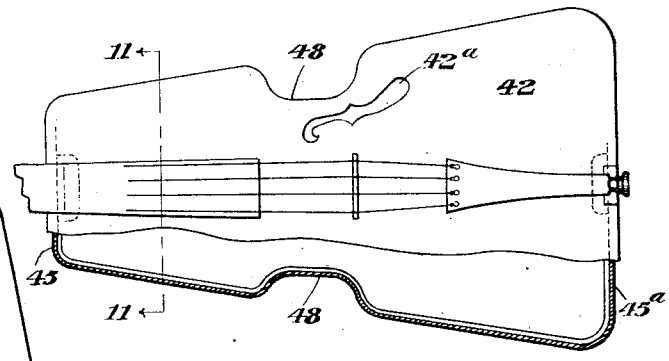


Fig. 9.

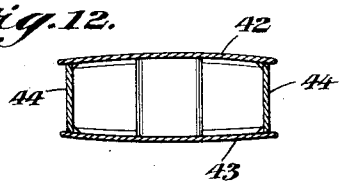


Fig. 11.

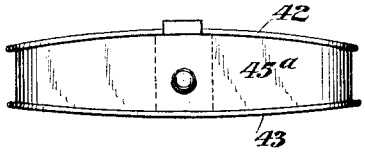


Fig. 10.

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UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF NEW YORK, N. Y., ASSIGNOR TO CADWELL COMPANY, A CORPORATION OF NEW JERSEY, TRUSTEE.

VIOLIN.

1,208,077. Specification of Letters Patent. Patented Dec. 12, 1916.

Application filed June 17, 1914. Serial No. 845,587.

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, and a resident of New York city, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Violins, of which the following is a specification.

This invention relates to violins and other instruments of the violin type, as the viola, cello, bass viol and the like.

The sound box of a violin has hitherto been constructed with an arched top or belly, an arched bottom or back, and sides or walls of substantially uniform height between the two. The arching of the belly and back is primarily for the purpose of taking up the strain exerted by the downward pressure of the bridge caused by the tension of the strings, as the arched construction stands up much better and resists distortion to better advantage than a flat construction. To secure this arching, it has hitherto been necessary to take a slab of a thickness several times the thickness of the finished belly or back and rout the piece according to carefully laid out diagrams until the proper proportions have been attained. This process is wasteful in material and involves considerable labor of a skilled workman, aside from the tediousness of the work requiring considerable time to finish an instrument. Moreover, after the instrument is completed, it takes a long time for it to develop its proper tone, as by the routing process, a large number of the wood fibers are cut, and as the vibration is transmitted to them by the cementing layer of gums and resins uniting these fibers, it is only after the gums become thoroughly hardened and set in proper relation to the fibers that the vibration is transmitted freely. The ordinary instrument thus requires many years to attain its responsiveness and mellow quality of tone. It has long been recognized that the flatter instruments of the Stradivarius type are much more brilliant and responsive than higher instruments of the German type. The reason for this is twofold, first, that the flatter instruments have fewer of the fibers cut in the belly and back, and furthermore, the flat instrument permits a freer vibration as is evident from the general physical law governing vibrating plates.

To avoid the expense involved in routing the instrument, resort has hitherto been made to press the parts into form by steaming the wood and subjecting the same to pressure in a mold or die. This steaming and pressing process, however, crushes the fibers and destroys their resonant qualities, and thus the instrument produced by this process has very inferior tone quality and does not at all answer the requirements of the musician.

According to present invention, a violin is provided with has all the superior tone qualities of the old instruments of the Stradivarius and Guarnerius types with the additional advantages consisting in the attainment of the mellow quality of tone and responsiveness of the instrument in a much shorter time. The instrument, moreover, at the same time, is comparatively easy to make and inexpensive.

In carrying out the invention, I make the belly and back of the instrument of flat pieces of wood which are arched longitudinally or transversely, or both longitudinally and transversely, by the arching of the sides. I thus secure the required sloping edges without routing and with a minimum cutting into the length of the fibers. In certain embodiments of the invention, a substantial trapezoidal outline of the sound box is used. This further reduces the number of cut fibers and affords easier access to the higher positions by reducing the width of the sound box at the forward end.

The various further objects and advantages will be more fully set forth in the accompanying description and the features of novelty will be particularly pointed out in the claims.

In the drawings illustrating certain of the preferred embodiments of the invention, Figure 1 is a plan view of a simple trapezoidal type of instrument having arched end walls. Fig. 2 is a longitudinal section taken on line 2—2 of Fig. 1. Fig. 3 is an end view looking in the direction of the arrows in Fig. 1, and Fig. 4 is a cross section taken on line 4—4 of Fig. 1, looking in the direction of the arrows. Fig. 5 is an end view similar to Fig. 3 illustrating a slightly modified form of belly. Fig. 6 is a plan view, and Fig. 7 is a side elevational view of a modified form showing the arching in the side walls. Fig. 8 is a side elevation, and Fig. 9 is a plan view of a modified form in which the end

walls are arched both above and below. Fig. 10 is an end view of the form illustrated in Fig. 8. Fig. 11 is a cross section taken on line 11—11 of Fig. 9. Fig. 12 is a plan view partly in section, illustrating a still further modification.

Referring in detail to the drawings, particularly to Figs. 1 and 4, the improved violin has the usual neck 10 and finger board 11, attached to the sound box. The latter is formed with a top or belly 12, bottom or back 13, side walls 14, and end walls 15. In order to decrease the number of cut fibers, the belly and back are formed with a substantially trapezoidal outline. This also decreases the width of the box adjacent the inner end of the finger board and facilitates the playing at the higher positions. The end walls are of gradually increasing depth approaching the middle of the instrument. The top edges of these walls thus slope upwardly toward the middle of the instrument and hold the belly of the sound box in arched form, as clearly appears in Figs. 3 and 4. The arching tends to stiffen the belly to withstand the pressure of the bridge but is maintained by the formation of the end walls themselves and not by routing the top from a thick slab, as has been done heretofore. The top may be formed in two pieces as illustrated in Figs. 3 and 4, or can be made in an integral piece bent over, as will be readily apparent. To further reduce the number of fibers cut in the shaping of the parts, the top and bottom are formed with a substantially trapezoidal outline and the sound holes 12^a extend substantially in the direction of the grain of the wood. If desired, the top may be thinned down at 16 adjacent to the walls, so as to secure greater freedom of vibration. Also, the walls may be formed with thickened portions 17 at their upper and lower edges, so as to form an extended surface to which the belly and back may be attached and thus dispense with the use of the lining hitherto employed.

In Fig. 5, the belly 22 is illustrated as tapering or thinning down gradually from the central portion to the side walls 14. The arching of the belly through the arch of the end walls is the same as in the first form described.

Referring to the embodiments of the invention illustrated in Figs. 6 and 7, the side walls 34 of the sound box are convexly curved in a vertical direction both at the top and at the bottom edges, thereby producing a longitudinal arching in the top 32 and bottom 33 of the sound box. Preferably, a waist portion 38 is formed at each side to facilitate the bowing as in the usual type of instrument. The general trapezoidal outline of the top and bottom is maintained with the slight rounding at the corners. The sound holes 32^a may be somewhat along the F style, conforming, however, more closely with the general outline of the waist portion, as will be readily seen from inspection of the drawing. I have found that in this longitudinal arch construction, a slight transverse arch also is formed, due to the tendency of the central portion 39 of the material between the sound holes to bend upward more sharply than the portions 40 of the edges of the top at the waist.

Referring to the embodiment of the invention illustrated in Figs. 8, 9 and 10, the top 42 and bottom 43 are given a curved transverse arch by the convex curvature of the top and bottom edges of the end walls 45 and 45^a. While the side walls 44 are of a uniform height throughout the greater portion of their length, the usual waist portions 48 are formed to facilitate the bowing and the sides are increased in height at these points to conform to the increased height between the top and bottom at those points, due to the transverse arching. The top may be formed with the usual sound holes 42^a symmetrical with the general outline which is preferably of a general trapezoidal shape with the exception of the rounded corners and the portion formed by the waist.

The walls or ribs of the sound box may be bent inward at the waist and bent around at the corners by the usual process or else specially molded pieces may be inserted at those points.

Referring to the modified form in Fig. 12, the side walls are formed with straight pieces 50 and 51 which are united by a molded piece 52 at the waist. A curved corner piece 53 unites the side wall 51 with the flat end wall 54. The opposite end wall 55 may also be molded so as to include the rounded corner extending to the wall 50. This forms a very inexpensive construction, as the various parts of the walls can be duplicated in large numbers and cemented together without requiring any bending or shaping.

I have described my improved violin as formed with a substantially trapezoidal outline. However, it will be understood that, without departing from the spirit of my invention, the improved construction may be embodied in a violin having the general Stradivarius or other standard outline, provided that the arching of the belly and back is produced by bending the flat plates over the arched sides.

While I have particularly described that the invention is adapted for a violin, it will be understood, of course, that it is applicable equally to other instruments of the violin type as the viola, cello, bass viol, and the like.

It will be noted that in all of the constructions illustrated, the arching of the top and

bottom is accomplished with substantially flat pieces which are bent to conform to the vertical arching in the walls or ribs of the instrument. The necessary stiffness is thus obtained with freedom of the plate to vibrate. Also the fibers are cut across with a minimum degree and the resonant qualities of the sound box are increased both in responsiveness and in mellowness of tone even when the instrument is new. The construction is, as will readily be seen, cheap to make both in labor and material.

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

1. A violin comprising a sound box having a belly formed with sound holes, a back, and walls spacing the belly and back entirely around the box, said walls being of gradually increasing depth approaching the middle of the sound box, said belly arching in accordance with the slope of the walls.

2. A violin comprising a sound box having a belly formed with sound holes, a back, side walls, and end walls spacing the belly and back entirely around the box, said end walls being of gradually increasing depth approaching the middle of the sound box, the belly arching according to the arch of the end walls.

3. A violin comprising a sound box having a belly with sound holes therein, the fibers in the belly running continuous throughout the length thereof except where cut by the sound holes, and walls spacing the belly and back entirely around the box, said walls being of gradually increasing depth approaching the middle of the sound box, said belly arching in accordance with the slope of the walls.

4. A violin comprising a sound box having a belly, a back, and walls spacing the belly and back entirely around the box, said walls increasing in depth toward the middle of the sound box, both said belly and back arching convexly in accordance with the slope of the walls.

5. A violin comprising a sound box having a belly, a back, side walls, and end walls, spacing the belly and back entirely around the box, said end walls being formed with convexly curved edges at the top and bottom thereof, the belly and back arching according to the curvature of the end walls.

6. A violin comprising a substantially trapezoidal sound box having a belly, a back, and walls spacing the belly and back entirely around the box, said walls being of gradually increasing depth approaching the middle of the sound box, said belly arching in accordance with the slope of the walls.

7. A violin comprising a sound box having a belly and back having a recessed portion intermediate their length to form a waist, end walls having gradually increasing depth approaching the middle of the box to form convexly curved upper and lower edges, side walls of substantially uniform depth at the longitudinal portion thereof and of greater depth at the waist portion.

8. A violin comprising a sound box having a belly and back of substantially trapezoidal outline, walls uniting said members having convexly curved upper and lower edges, said belly arching in accordance with the curvature of the walls.

9. A violin comprising a substantially trapezoidal sound box having lateral indentations forming a waist, end walls having curved edges, side walls of substantially uniform depth throughout the continuous portion of the lateral edges and of an increasing depth at the waist portion, said belly and back being arched in accordance with the curvature of the walls.

10. A violin comprising a sound box having a back and belly of substantially trapezoidal outline and provided with lateral indentations forming a waist portion, flat walls having edges sloping upwardly toward the middle of the instrument and rounded corners uniting the back and belly, and molded curved pieces uniting said flat pieces.

11. A violin comprising a sound box having a back and belly of substantially trapezoidal outline and provided with lateral indentations forming a waist portion, flat walls having edges sloping upwardly toward the middle of the instrument providing increased depth at the middle, and rounded corners uniting the back and belly, and a separate curved piece uniting said flat pieces at the waist and corners.

12. A violin comprising a sound box having a back and belly, walls uniting the back and belly and spacing the same entirely around the sound box, said walls comprising flat pieces for the ends and sides, and curved molded pieces uniting the flat pieces and forming rounded corners and rounded indentations to form the waist of the instrument.

Signed at New York city, in the county of New York and State of New York, this 11th day of June, A. D. 1914.

FRANK M. ASHLEY.

Witnesses:
WM. I. COHEN,
MINNIE S. MILLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington. D. C."