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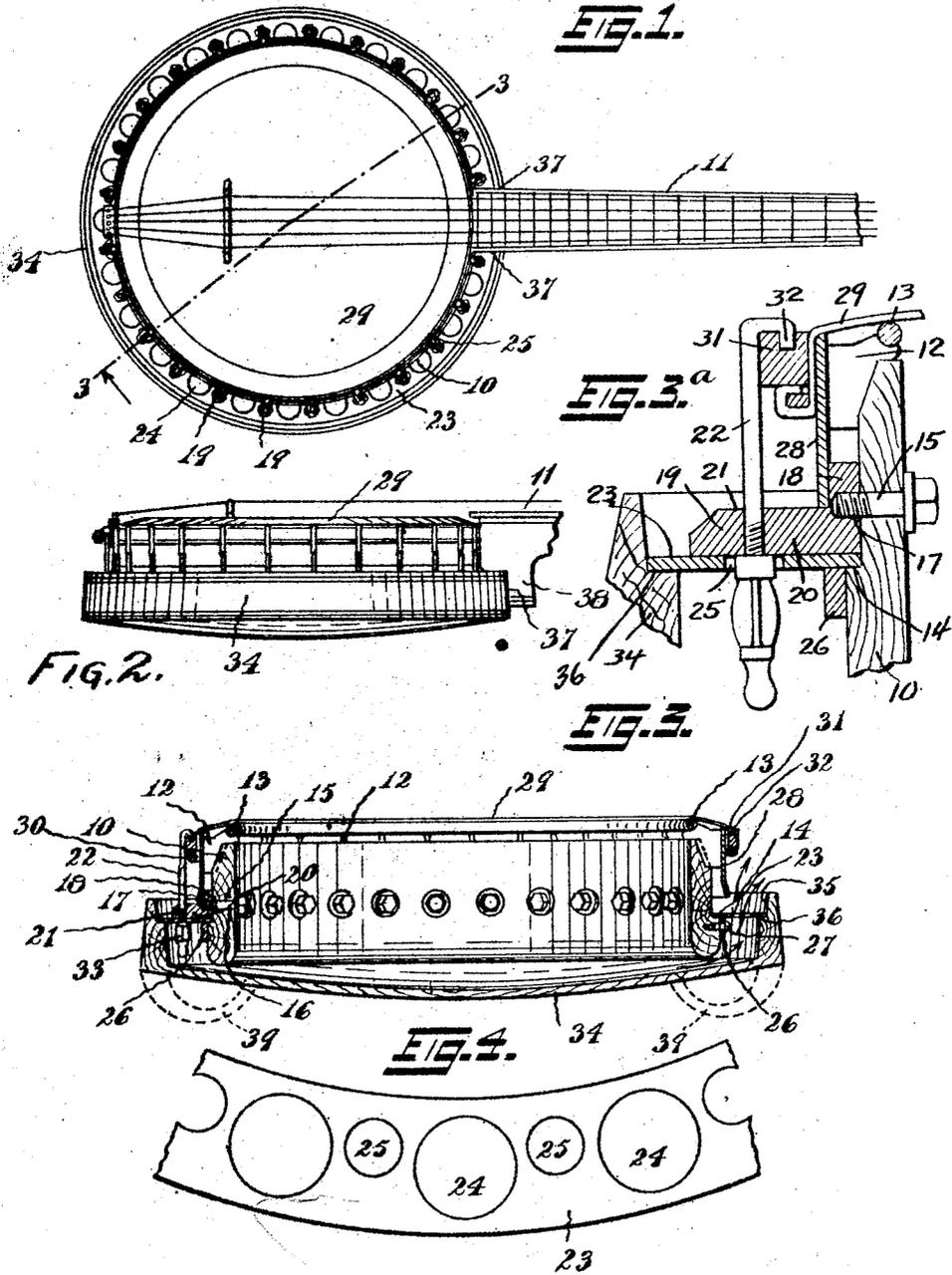
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SHELL RESONATORS FOR BANJOS

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SHELL RESONATORS FOR BANJOS.

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To all whom it may concern:

Be it known that I, WILLIAM L. LANGE, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Shell Resonators for Banjos, of which the following is a specification.

The present invention relates to musical instruments and particularly to banjos, and one object is to provide a banjo comprising a frictionally held, freely detachable, combined resonator and sound reflector, the important function of which is to maintain the playing portion of the instrument, or banjo proper, a predetermined distance away from the body of the performer, thereby preventing smothering of the tone quality of the instrument, while due to the vibrant sounding board of the resonator the resonance of the instrument is increased, and due to its curved reflecting surface the sound is reflected away from the performer towards the audience.

Another object is to provide a combined resonator and sound reflector which may be used with any banjo having a relatively high sided frame and the customary straining hooks and brackets connected to the frame for supporting the straining hooks, the combined resonator and sound reflector not being restricted in use to a banjo of the construction shown.

In the accompanying drawings, which illustrate one of the possible embodiments of the invention and form part of this specification, Figure 1, is a plan view of the banjo and the combined resonator and sound reflector, part of the neck of the banjo being broken away.

Figure 2, is a side elevation of the banjo and combined resonator and sound reflector shown in Fig. 1.

Figure 3, is a sectional side view on the line 3—3 of Fig. 1, looking in the direction of the arrow, and on a larger scale than Fig. 1, a modified form of bottom for the resonator and sound reflector being shown in outline.

Figure 3^a, is a fragmentary detail sectional view, on an enlarged scale, showing the operative arrangement of the straining hooks.

Figure 4, is a fragmentary plan view, on an enlarged scale, of a supporting and spacing flat ring co-operating between the banjo

body and the combined resonator and sound reflector.

Similar reference characters denote similar parts throughout the several views.

To the accomplishment of the above objects and such other objects as may be disclosed in the course of the following description for illustrating the invention by one embodiment thereof, the invention being defined by the appended claims, the invention comprises the annular frame or shell 10, preferably of wood, having the neck 11, operatively connected thereto.

The frame or shell 10 is provided on its upper edge with the series of supports 12, preferably of metal, spaced apart, and provided with notches 12' in which the tone ring 13 rests.

The frame or shell 10 on its outer side is cut away to form the annular ledge or shoulder 14, and above the ledge or shoulder 14 is provided with a series of spaced transverse holes 15 through the frame or shell, the threaded ends of the stems of the bolts 16 passing through the holes 15 from the interior of the frame or shell outwardly and engaging in threaded holes 17 in the upwardly extending portions 18 of the brackets 19 for securing these brackets to the frame or shell. The main portion or body 20 of each of the brackets 19 has a hole 21 transversely through the main portion or body for receiving the end portion of the stem of each of the straining hooks 22 later mentioned, the hooks 22 passing through the holes 21, the lower end portions of the hooks being threaded and extending below the bottoms of the brackets 19.

The supporting and spacing ring 23 is a flat metallic ring, open or divided at its forward ends to provide for the neck 11 of the banjo, and has through it the series of sound openings 24, circular as shown, spaced apart for the length of the ring, there being a series of smaller openings 25, circular as shown through the ring 23 between the openings 24 intended for passage of the nuts 33 of the straining hooks 22 there-through, the opening 25 being enlarged to permit passage of sound around said nuts 33. The inner edge of the supporting and spacing ring 23 rests upon the ledge or shoulder 14 of the frame or shell and upon the upper edge of the annular band or ring 26, which is also open or divided at its forward ends to provide for the neck 11 of

the banjo. The band or ring 26 is secured to the outer side of the frame or shell 10, as by the screws 27, the supporting and spacing flat ring 23 at its inner edge being held or clamped between the under sides of the brackets 19 and the upper edge of the annular band or ring 26.

The annular frame band 28 is arranged around the frame or shell 10 exteriorly thereof, being spaced from the frame or shell by the upwardly extending portions 18 of the brackets 19. The frame band 28 is of relatively thin but rigid metal and its lower edge, which is flared slightly outwardly, rests upon the upper surfaces of the main portions or bodies 20 of the brackets 19, and is spaced from the frame or shell 10 by the upwardly extending portions 18 of these brackets. The frame band 28 extends upwardly to a horizontal plane somewhat below the horizontal plane of the upper edge of the tone ring 13, and is maintained in position by tension of the diaphragm or head 29.

For tensioning the head or diaphragm 29, it is drawn downwardly over the tone ring 13 and its lower edge is turned or wrapped over an annular band or ring, such as 30, arranged exteriorly around the frame band 28. The rim 31, which preferably is of metal, is arranged exteriorly of the side of the diaphragm or head and bears down upon the upper surface of the portion thereof which is turned or wrapped over the annular band or ring 30, the rim 31 being drawn down for tensioning the diaphragm or head by the hooked ends of the straining hooks 22 which engage in an annular groove 32 in the upper edge of the rim 31, the adjusting nuts 33 passing through the holes 25 of the ring 23 with space therearound as shown in Fig. 1, and engaging the threaded ends of the hooks 22 and by turning bearing against the under surface of the brackets 19 for thereby drawing down the straining hooks; the ring 23 constituting a single planed annulus which extends outwardly beyond the diameter of the vellum tensioning means, and provided with sound emitting means or openings which lay in a plane parallel to the plane of the vellum.

The combined resonator and sound reflector 34 is a circular member, preferably of wood, having upright sides or walls and a concavo-convex resonating and sound reflecting bottom, the diameter of the resonator and sound reflector being sufficient to receive the supporting and spacing ring 23 substantially between the sides of the interior of the resonator and sound reflector and the outer sides of the frame or shell of the banjo when the resonator and sound reflector is operatively connected to the banjo, and also sufficiently greater than the diameter of the frame or shell, and

having the curve of its bottom arranged to permit passage of sound through the openings 24 and 25 of the supporting and spacing ring 23, and between the outer sides of the frame or shell and the sides of the interior of the resonator and sound reflector, and between the under edge of the frame or shell and the interior of the bottom of the resonator and sound reflector, as indicated by the arrows in Fig. 3.

The vellum 39 being spaced away from the upper edge of the shell 10, it will be noted that the sound passes from the interior of the shell over the upper edge thereof between the vellum and shell and thence downward to the resonator and is emitted therefrom in the direction in which the banjo is faced.

The resonator and sound reflector 34 has near its upper edge the interior annular rabbet 35 which forms the annular shoulder 36, the sides of this rabbet from the top thereof to the shoulder 36, preferably, being slightly inclined inwardly. The resonator and sound reflector at one point in the edge of its side or wall is provided with a recess or cut out portion 37, extending downwardly from the upper edge of the resonator and sound reflector, which recess conforms in shape to the shape in cross section of the downward extension 38 of the neck 11 of the banjo for receiving the neck of the banjo snugly therein. The resonator and sound reflector is attachable to the banjo, when said extension is received in said recess, by pushing the resonator and sound reflector upwardly until the ledge or shoulder 36 is brought into contact with the under surface of the outer edge of the supporting and spacing ring 23, shown in Fig. 3, the inclined sides of the rabbet 35 acting as a cam face, the resonator and sound reflector thus being maintained in operative relation to the banjo and being freely detachable therefrom.

The bottom of the resonator and sound reflector may be modified as shown in outline at 39 in Fig. 3, for the purpose of providing greater space for passage of sound between the lower edge of the frame or shell and the interior of said bottom.

From the foregoing description and by inspection of Fig. 3, it will be noted that the resonator and sound reflector, when of suitable diameter relative to such banjo, may be used with any relatively high sided banjo having straining hooks supported by brackets, by securing to the outer side of such banjo an annular band or ring, such as 26, below said brackets so as to clamp a flat supporting and spacing ring, such as 23, between the under sides of the brackets and the above mentioned annular band or ring, and then pushing the resonator and sound reflector into operative position.

Having thus described my invention, it should be understood that there may be modifications thereof and variations therein without departing from the spirit of the invention or exceeding the scope of the appended claims.

What I claim and desire to protect by Letters Patent is:—

1. The combination, with a banjo comprising a shell, a diaphragm stretched over the shell, means for tensioning said diaphragm, and means supported by the shell for supporting said tensioning means, of a flat ring; means secured to the exterior of the shell below said supporting and tensioning means for supporting the flat ring at its inner edge; and a resonating and sound reflecting member engageable with the outer edge of said flat ring whereby said member is supported and spaced away from said shell by the flat ring; the flat ring having means for permitting passage of sound therethrough.

2. The combination, with a banjo comprising a shell, a diaphragm stretched over the shell, means for tensioning said diaphragm, and means supported by the shell for supporting said tensioning means, of a flat ring; means secured to the exterior of the shell below said means for supporting the tensioning means for supporting the flat ring at its inner edge; and a resonating and sound reflecting member engageable with the outer edge of the flat ring whereby said member is supported and spaced away from the shell by the flat ring; said member being frictionally held to the flat ring and manually detachable therefrom; the flat ring having openings therethrough for passage of sound; said member being circular and having substantially straight sides and a curved bottom, there being space for free passage of sound between said side walls and the outer sides of the shell and between the under edge of the shell and the interior surface of said curved bottom.

3. As articles of manufacture and sale for use with a banjo, a resonating and sound reflecting member; an annular member for supporting said member on the exterior of the shell of the banjo and spacing said member away from the sides of the shell; and a band to be secured to the exterior of the shell for providing support for the annular member at the under side thereof; the resonating and sound reflecting member being engageable with said annular member for attachment thereto and being freely detachable therefrom; the annular member being provided with openings for passage of sound therethrough.

4. In combination, a frame; a diaphragm disposed over said frame; means forming an upper sound passage above said frame; and means whereby the sound from the upper

passage is deflected away from the body of the user.

5. In combination, a frame; means to provide a lower sound passage under the frame and up at the side of said frame; a diaphragm disposed over said frame; and means forming an upper sound passage above said frame to the space above the outlet of said lower passage where the sound from the upper passage meets the sound coming from the lower passage, and is thereby deflected away from the body of the user by the sound from the lower passage.

6. In combination, a frame; a resonator having side walls spaced from the frame to provide a lower resonating chamber; a diaphragm disposed over said frame; and means forming an upper sound passage above said frame to the space above said chamber where the sound from the upper passage is deflected away from the body of the user by the resonator.

7. In combination, a frame; a resonator having side and bottom walls spaced from the frame to provide a lower sound passage under the frame and up at the side of said frame; a diaphragm disposed over said frame; and means forming an upper sound passage above said frame to the space above the outlet of said lower passage where the sound from the upper passage combines with the sound coming from the lower passage.

8. In combination, a frame; a diaphragm over the frame; and means forming sound exits at the upper and lower parts of the frame.

9. In combination, a frame; a spacing ring secured around said frame and provided with sound openings, a resonator spaced from the frame and having a closed bottom, and a side wall received on the spacing plate to provide a sound passage under the frame and up through said openings; a frame band spaced around said frame and above said spacing ring; a tone ring spaced from the top of the frame; and a diaphragm disposed over said tone ring and band; said tone ring, diaphragm and band forming a sound passage above said frame to the space above said openings, where the sound meets and combines with the sound coming around the bottom of the frame and up through said openings.

10. A flat spacing ring provided with large sound openings and an inner periphery large enough in diameter for engagement with and around an annular banjo frame.

11. A substantially flat spacing ring provided with large sound openings and inner and outer engagement peripheries.

12. A spacing ring provided with sound openings and nut receiving openings.

13. A spacing ring for securing together in spaced relation, an annular frame and a

resonator, said frame comprising a metal ring provided with large sound openings and an inner engagement periphery, the height of the ring being less than its width.

5 14. A spacing ring comprising a flat annular sheet metal ring provided with sound openings.

15 15. A flat metallic spacing ring provided with large sound openings.

10 16. A spacing ring provided with large sound openings and an inner engagement periphery, substantially in the plane of the major portion of the ring.

15 17. A spacing ring for securing together in spaced relation an annular frame and a resonator, said ring comprising a flat annular sheet metal ring provided with large sound openings and smaller nut openings and inner and outer engagement peripheries.

20 18. In combination, an annular wooden frame; a flat annular spacing ring secured around said frame and provided with sound openings; a sound resonator and reflector having a bottom spaced from the
25 bottom of the frame, and side walls surrounding and spaced from the frame and secured around the outer edge of the spacing ring; and a diaphragm tensioned over said frame.

30 19. In combination, an annular frame having a ledge on its outer face; a flat annular spacing ring resting on said ledge and provided with sound openings; a resonator spaced from the frame and having
35 side walls surrounding and secured to the outer edge of the spacing plate; and a diaphragm tensioned over said frame.

40 20. In combination, a frame; a separate flat annular spacing ring secured around said frame and provided with sound openings; a resonator spaced from the bottom of the frame and comprising bottom and side walls spaced from the frame and secured
45 near its upper part around the outer edge of the spacing ring; a frame band spaced from said frame and spacing ring; and a diaphragm disposed over said frame.

50 21. In combination, an annular frame; a diaphragm thereon; a flat spacing ring secured around said frame and provided with sound openings; and a resonator spaced from the frame and frictionally receiving the spacing plate.

55 22. In combination, a frame; a spacing ring secured around the frame and provided with sound openings; a sound resonator and reflector having a bottom spaced from the bottom of the frame, and side walls surrounding and spaced from the frame and
60 frictionally detachably received on the outer edge of the spacing ring; and a diaphragm tensioned over the frame.

5 23. In combination, a frame; a spacing ring secured around said frame and provided with sound openings; a sound reso-

nator and reflector having a bottom slightly spaced from the bottom of the frame, and side walls surrounding and spaced from the frame and provided near the upper part with a slightly upwardly flaring rabbet frictionally detachably receiving the outer edge
70 of the spacing ring; and a diaphragm tensioned over said frame.

24. In combination, a frame; a ring secured around said frame and provided with
75 sound openings and nut openings; a resonator secured to the ring; brackets resting above said spacing ring secured on the outer face of the frame; a diaphragm disposed over said frame and provided with a rim; straining hooks engaging the rim and extending through said brackets; and nuts on said hooks in said nut openings out of contact with the spacing ring and engaging
80 against said brackets.

25. In combination, a frame; supports resting on said frame and each provided at its upper part with a notch; a tone ring resting in said notches; and a diaphragm disposed over said tone ring.
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26. In combination, an annular frame; supports comprising plates radially resting on said frame, each provided at its upper inner part with an arcuate notch; a tone ring resting in said notches spaced from
90 the frame; and a diaphragm tensioned over said tone ring.

27. In combination, an annular frame; brackets secured on said frame; a frame band spaced from said frame and resting on
100 said brackets; supports radially resting on said frame and against said band, each provided at its upper inner part with an arcuate notch; a tone ring resting in said notches spaced from the frame; a diaphragm disposed over said tone ring and band and provided with a rim; and straining means tensioned between the rim and said brackets.
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28. In combination, a frame; brackets each having an upwardly extending portion secured on the outer face of the frame; a frame band spaced from said frame and resting on said brackets around said upwardly extending portions; a tone ring spaced from the top of the frame; a diaphragm disposed over said tone ring and band and provided with a rim; straining hooks engaging the rim and extending through said brackets; and nuts on said hooks engaging against said brackets.
110 115

29. In combination, an annular frame; a sound resonator and reflector having a bottom spaced from the bottom of the frame and side walls surrounding and spaced from the frame to form sound passages therebetween; a diaphragm disposed over said frame; and means for forming an upper sound passage at the upper part of said frame.
120 125

30. In combination, an annular frame; 130

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means including a sound resonator and reflector forming a sound passage at the bottom of the frame and having side walls surrounding and spaced from the frame; a diaphragm disposed over said frame; and means including a tone band for forming a sound passage from the interior of the frame to the space in the upper part of said resonator and reflector.

31. In combination, an annular frame; an annular spacing ring secured around the outside face of said frame and provided with sound openings; a sound resonator and reflector spaced from the frame to provide a sound passage therebetween and secured

around the spacing ring; and a diaphragm tensioned over said frame.

32. In combination, an annular frame; a spacing ring secured around the outside of said frame and provided with sound openings; a sound resonator and reflector including a bottom spaced from the bottom of the frame, and side walls surrounding and spaced from the frame and secured to the spacing ring, whereby a sound passage is formed from the interior of said frame through said sound openings; and a diaphragm tensioned over said frame.

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