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REED FOR MUSICAL INSTRUMENTS

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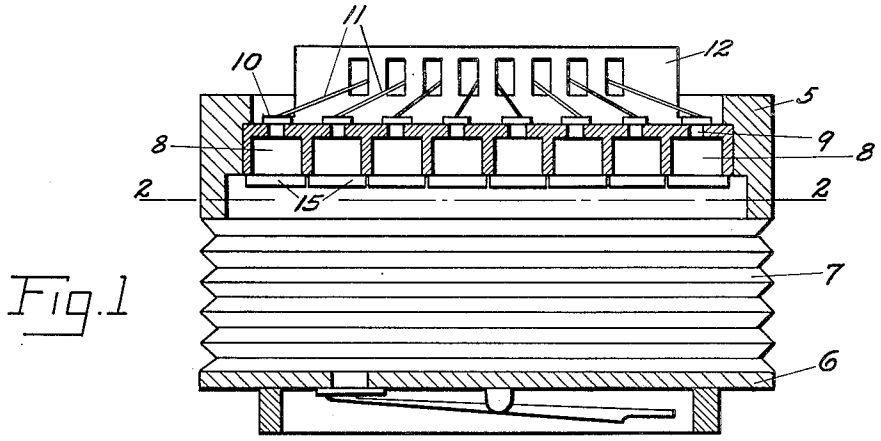
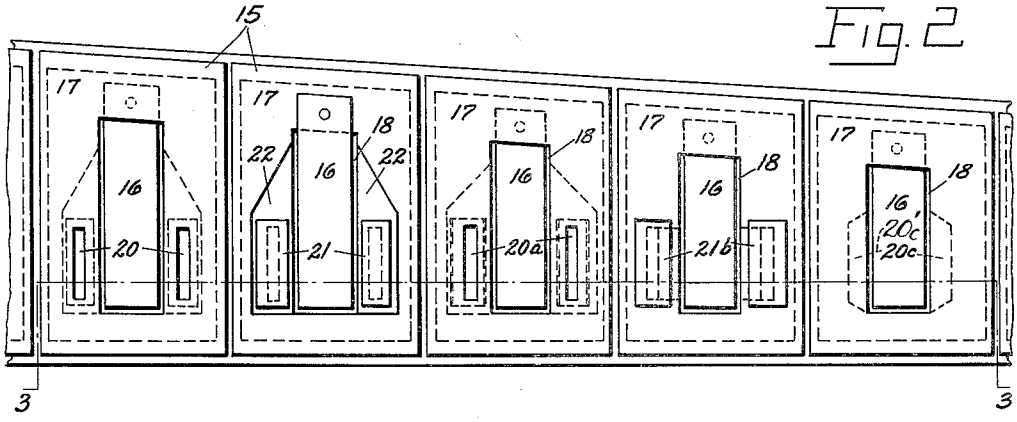


Fig. 1

Fig. 2



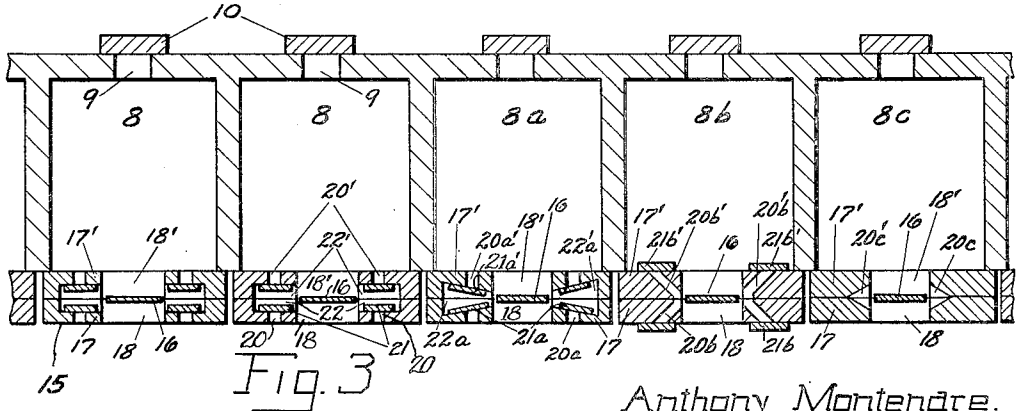


Fig. 3

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REED FOR MUSICAL INSTRUMENTS

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8 Claims. (Cl. 84—375)

My invention relates to musical instruments of the general nature of an accordion, melodion, or the like, employing wind operative on reed to produce the desired musical notes; and more particularly it relates to improvements in the construction of the reeds, whereby all the usual musical notes may be produced by substantially one-half the number of reeds heretofore found necessary, with resulting economy in original manufacturing costs, simplification in tuning, and a material reduction in the weight of the complete instrument.

Heretofore it has been the common practice to employ two vibrating tongues in each reed, each protected by a flap valve, so that one may operate only by wind movement in one direction and the other only by reverse movement of the wind. This has necessitated a multiplicity of reed tongues, and the difficulty of maintaining equal tune in the necessary two separate ones for each note, besides unduly increasing the total necessary weight of the instrument.

My present primary object is to provide an improved reed having a single vibrating tongue operative by wind movement in either direction to produce a desired note, and it comprises the special reed construction hereinafter more fully described in connection with the accompanying drawing, the novel features of which are set forth in the appended claims.

Referring to the drawing which shows a preferred embodiment of my improved reed indicated as applied to an accordion of usual construction,—

Fig. 1 indicates in sectional elevation sufficient of a usual accordion construction to fully disclose one embodiment of my improved reed applied thereto.

Fig. 2 is a fragmentary sectional view, on the line 2—2 of Fig. 1, showing on an enlarged scale, a series of cells or sound chambers each having a reed mounted thereon, the reeds being different for certain cells to disclose varied embodiments of my invention.

Fig. 3 is a cross sectional view, on the line 3—3 of Fig. 2, showing respectively sectional views of the several reeds appearing in Fig. 2.

In the accordion shown in the drawing, 5 represents one end box, 6 the opposite end box, 7 the connecting bellows, 8, 8 a series of cells or sound chambers each having an orifice 9 covered by the key pad 10, said pads being lifted to admit or release air through wires 11 extended to a key board 12 for convenient selective manipulation by the operator. Opening the bellows 7 by spreading apart the end boxes 5 and 6 will draw in air through such cells 8 which have their key pads 10 raised by action of the corresponding key or board 12; and closing together of end boxes 5 and 6 will force the air confined in the bellows 7 to escape through such cells 8 as have their key pads 10 raised by action of the corresponding key of board 12. It will thus be seen that the cells or sound chambers 8, 8 have air drawn into them by opening of the bellows, and air forced out of them by closing of the bellows, and selection of the cells thus acted upon by the air is determinedly controlled by the operator manipulating the key board 12 to raise corresponding key pads 10 to uncover the orifice 9 of such selected cells. This action is common and well known, and its general principle utilized in other wind instruments employing reeds to produce musical notes by action of the air passing through the respective cells or sound boxes.

In the apparatus above described, it has been common practice to cover the open end of each cell or sound box 8, opposite its orifice 9, with a reed secured thereto usually by a suitable wax, such reed heretofore, as before stated, necessarily having two vibrating tongues, one operated by air entering through the orifice 9 upon opening of the bellows 7, and the other operating by closing of the bellows to force air out through said orifice.

In my improved reed, indicated generally by the reference 15, I employ a single vibrating tongue 16 adapted to be operated by air flowing in either direction and producing the same identical note by either movement.

The reed 15, in the preferred embodiment of the drawing, is known as a free reed, and consists, in the special construction shown, of two similar plates 17, 17′ superimposed and having registering elongated apertures 18. The tongue 16 is shown as having one end clamped between the plates 17, 17′, and its free end projecting into and closely fitting within said registering apertures 18, 18′ and normally lying therein in the plane of the contacting surfaces of said plates 17, 17′.

In order that the reed thus made up may operate by air flow in either direction to vibrate the tongue 16 to cause a musical note determined by the size of said tongue and its particular cell or sound chamber, it is necessary to insure for more passing air than may be secured by the desirable close fit of the reed 16 in slot 18—18′.

In Fig. 3 I have indicated several ways of thus increasing the air flow, the cells being marked 8, 8, 8*a*, 8*b* and 8*c* to distinguish the varied forms. The form for cell 8*c* is the simplest and requires no flap valve of any nature, and comprises merely opposed chambers 20*c*, 20*c*′ on each side of the tongue 16, producing a true note by air flow in either direction, but muted or muffled more or less, and not of the desired full volume of tone.

Cell 8*b* indicates additional air admitted through slots 20*b*, 20*b* in each plate 17, 17′, said slots being shown as angularly inclined with their

inner ends opening into the aperture 18—18' adjacent the tongue 16 and their outer ends opening through the outer faces of plates 17, 17'. Each slot outer end is shown as provided with a flap valve 21*b*, 21*b*', and these operate in pairs, so that air flow into cell 8*b* through aperture 18, 18' closes the nearer flap valves in the direction of its flow and additional air escapes by opening the opposing flap valves; and reverse air flow reverses the action of such flap valves.

Cell 8*a* indicates another form, the plates 17, 17' being provided with opposing recesses forming enclosed chambers 22*a*, 22*a*, indicated as having angular walls and opposing slots 20*a*, 20*a*' forming air openings through said plates, internal flap valves 21*a*, 21*a*' closing the several slots, additional air flow in this type is in the direction of flow through the nearer slots and escape through aperture 18, 18', the far slots being closed by their flap valves due to such air flow; and reverse flow reverses the air movements through said slots.

In cells 8, 8, somewhat similar interior chambers 22, 22' are shown of rectangular form with slots 20, 20' and flap valves 21, 21 in said chamber, the air flow being the same as that described for cell 8*b*.

The flap valves are preferably of soft leather secured at one end, or along one edge, so that air flow in one direction may readily raise them, and reverse air flow securely seat them.

My improved reed, thus fully described, provides for true sound action of the cell or sound chamber 8 by vibration of the tongue 16 induced by air flow through the aperture 18, 18 in either direction. It thus reduces the number of vibrating tongues required in a complete instrument to one half the number heretofore found necessary, reduces the cost of manufacture, and avoids the delicate filing and scraping of the two tongues heretofore used, which was necessary to attune them accurately to the same note. And the reduced number of tongues, ordinarily of metal, materially reduces the weight of the instrument, particularly desirable in the accordion shown.

My improvements are applicable to all wind instruments employing reeds of the same or equivalent nature to that above described. And it will be understood that I do not limit myself to the preferred embodiment of my invention as shown in the drawing and above fully described, as modifications and changes other than those shown and described may readily be developed within the spirit of my invention as defined in the following claims.

What I claim is:

1. In a wind instrument having a sound chamber, controls for reversely directing air flow through said chamber, and a reed in the path of said air flow comprising a plate having an aperture, a vibrating tongue centrally mounted in said aperture and adapted to produce the same musical note by air flow through said aperture in either direction, sound volume increasing air passageways in said frame, and a valve for each passageway adapted to permit air flow therethrough in one direction only.

2. In a wind instrument having a sound chamber, controls for reversely directing air flow through said chamber, and a reed in the path of said air flow comprising a plate having an aperture, a vibrating tongue centrally mounted in said aperture and adapted to produce the same musical note by air flow through said opening in either direction, a plurality of sound volume increasing air passageways in said frame having their inner ends directed toward said control tongue, and a valve for the outer end of each passage way adapted to permit air flow therethrough in one direction only.

3. A reed for the sound chamber of a wind instrument, comprising a plate having an aperture, a vibratable tongue having one end fixed in said frame and its free end located in said aperture midway between the upper and lower surfaces of said plate, sound volume increasing air passage ways in said plate, and valves adapted to limit air flow to one direction only through the respective air passage ways.

4. A reed for the sound chamber of a wind instrument, comprising a plate having an aperture, a vibratable tongue having one end fixed in said plate and its free end located in said aperture midway between the upper and lower surfaces of said plate, a plurality of sound volume increasing air passage ways in said plate having their inner ends directed toward said tongue, and a valve at the outer end of each passage way adapted to limit air flow therethrough in one direction only.

5. A reed for the sound chamber of a wind instrument, comprising a pair of similar plates having registering elongated apertures, a vibratable tongue having one end fixed between said plates and its free end projecting into said registering apertures in the plane of their contacting surfaces, an air passageway sound volume increasing slot in each plate having its inner end opening into said aperture adjacent said tongue and a flap valve covering its outer open end and adapted to limit air flow therethrough in one direction only.

6. A reed for the sound chamber of a wind instrument, comprising a pair of similar plates having registering elongated apertures, a vibratable tongue having one end fixed between said plates and its free end projecting into said registering apertures in the plane of their contacting surfaces, an air passageway sound volume increasing slot in each plate having its inner end opening into said aperture adjacent said tongue, said inner slot ends being in opposed relation relative to said tongue and the outer slot ends opening through the outer surfaces of said plates on opposite sides of said registering apertures, and flap valves for the outer slot ends adapted to limit air flow to one direction only through their respective slots.

7. A reed for the sound chamber of a wind instrument, comprising a plate having an aperture, a vibratable tongue having one end fixed in said frame midway between the upper and lower surfaces of said plate, and air chambers in said frame opening into said aperture adjacent said tongue, opposing air slots for each chamber, and separate valves for said slots within said chambers adapted to permit air flow through said slots in one direction only.

8. In a wind instrument having a sound chamber, controls for reversely directing air flow through said chamber, and a reed in the path of said air flow comprising a plate having an aperture, a vibratable tongue centrally mounted in said aperture and adapted to produce the same musical note by air flow through said aperture in either direction, and sound volume increasing air-passageways through said frame communicating with said aperture adjacent the side edges of said vibratable tongue.

ANTHONY MONTENARE.