June 15, 1965 D. J. WINCH 3,188,903

BELLOWS OPERATED MUSICAL INSTRUMENTS

Filed May 14, 1964 2 Sheets-Sheet 1

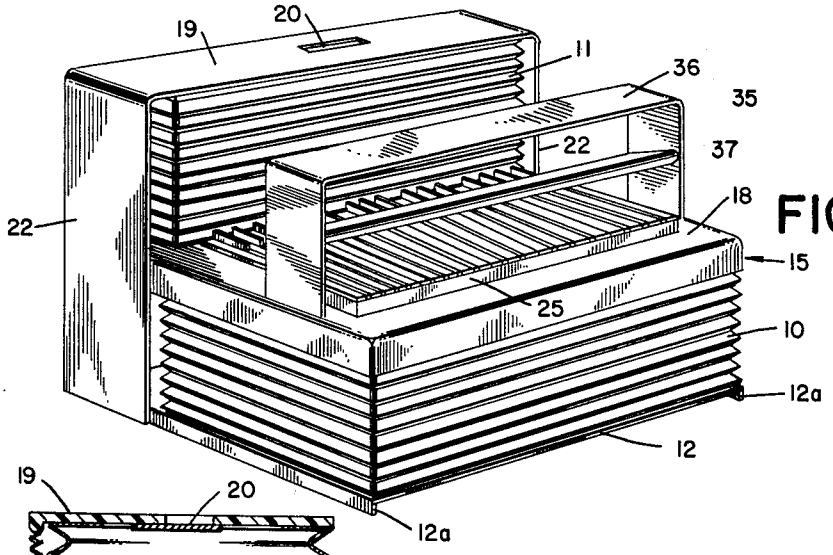
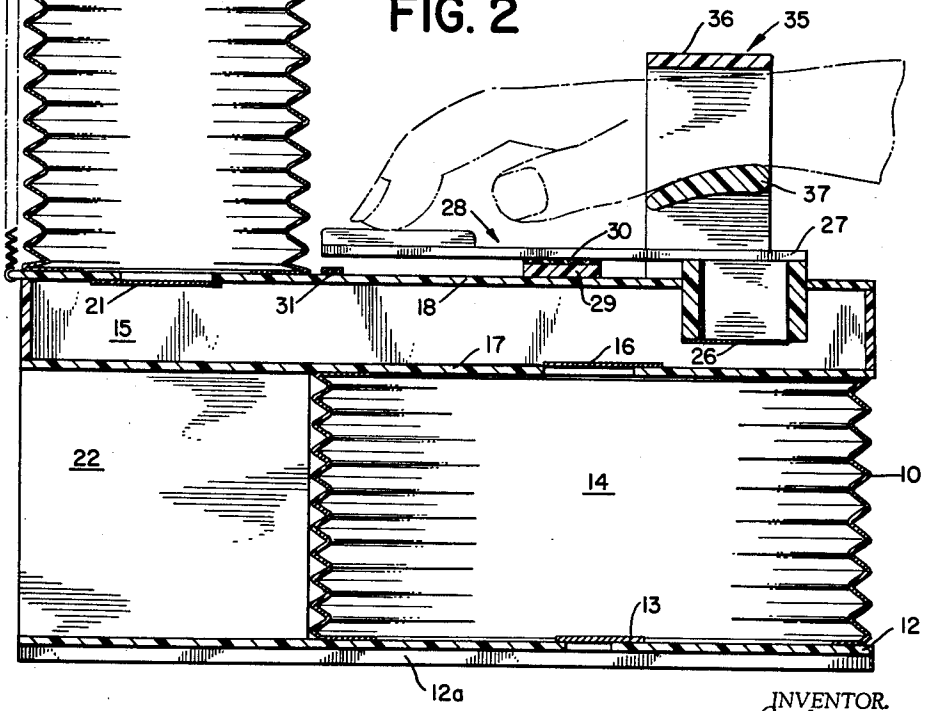


FIG. 1

FIG. 2



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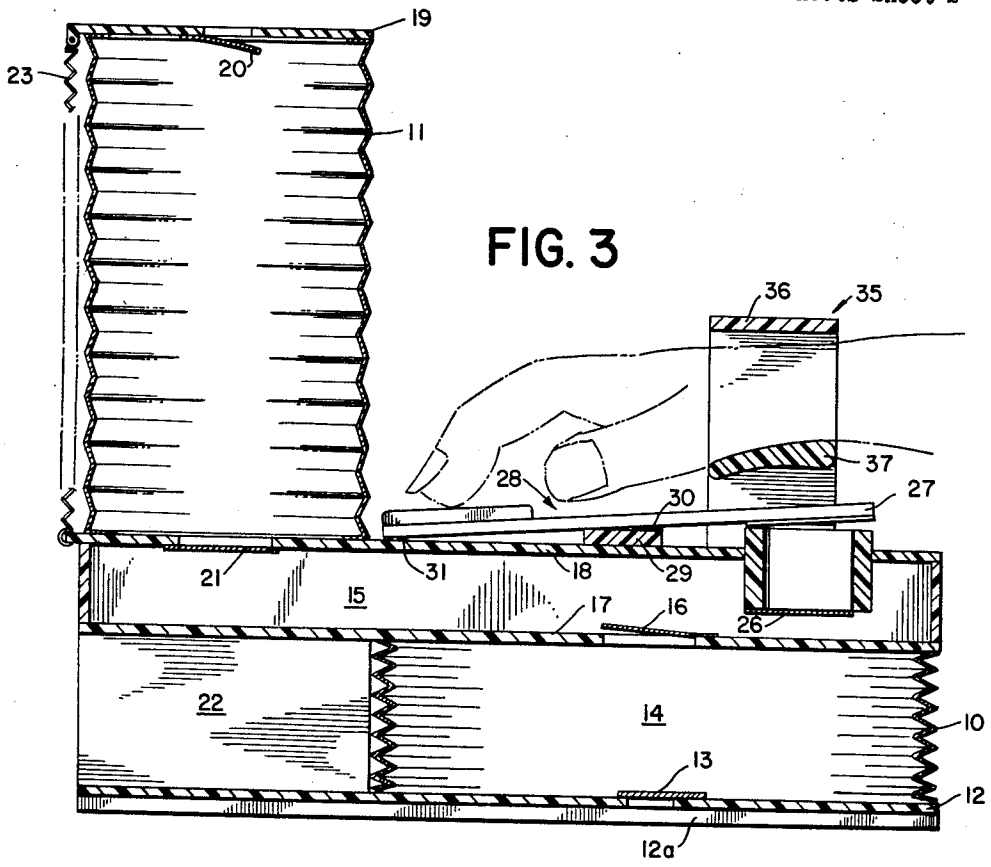


FIG. 3

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BELLOWS OPERATED MUSICAL INSTRUMENTS

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7 Claims. (Cl. 84—375)

This invention relates to bellows operated musical instruments such as of the organ or accordion type.

The principal object of this invention is to provide an improved air flow system for the usual reed box incorporated in instruments of the above type. More specifically, I have devised a bellows system which comprises two separate bellows which have an unusual method of operation in that one of the bellows is compressed by the pressure of the heels of the playing hands of the user, the same pressure being employed to simultaneously expand the other bellows. Thereafter, the operation is reversed, still being controlled by the player's hands, such reverse operation being controlled by the back of the hand. As a result, many artistic and varied effects may be achieved by such manual regulation of the bellows, at the same time that the keys are being played. Further, the use of the hands to operate the bellows simplifies and reduces the overall size of the instrument.

The particular arrangement of the bellows in my instrument makes possible a substantially continuous flow of super-atmospheric air through the reed box since each bellows will operate alternately and cooperatively in directing such air through the reed box. It is important to observe that only one set of reeds is required, both bellows serving the same set of reeds. Of course this simplifies manufacture, tuning, etc. However, this particular aspect is not new per se except in conjunction with my unique bellows system as hereinafter shown.

My instrument is most convenient to use since it can rest on a table or on the user's lap.

The invention will be further understood from the following description and figures in which;

FIGURE 1 is a front perspective view of my improved organ type instrument in the neutral or rest position;

FIGURE 2 is an enlarged, cross-sectional view; and

FIGURE 3 is a view similar to FIGURE 2 but showing the downstroke in the operation of the instrument.

As will be observed, the instrument is substantially L shaped having a front, lower bellows **10** and a rear upper bellows **11** which is offset relative thereto. Front bellows **10**, as will hereinafter be shown, serves as a support or platform for the keyboard through the intervention of a rectangular reed box. Accordingly, it is preferable, but of course not necessary, that the bellows **10** have a front to back width which is slightly greater than that of bellows **11**. For example, such width of bellows **10** may be about 9" while that of bellows **11** may be 5".

Bellows **10** is provided with a stationary floor **12** which will extend across the entire instrument while side strips **12***a* support the instrument above a resting surface. Floor **12** is provided with a conventional form of intake valve **13** which draws air into compartment **14** when the bellows **10** is expanded. On the other hand, when bellows **10** is compressed, valve **13** closes and air is delivered to centrally disposed reed box **15** through delivery valve **16** of conventional form.

Reed box **15** is rectangular and may be about 1½" high. It will be recognized, of course, that all these dimensions are purely representative and may be varied considerably.

The floor **17** of reed box **15** serves as the top plate of lower bellows **10**, while the top plate **18** of the reed box serves both as a platform and as the support or floor for the upper bellows **11**. In other words, the top plate of lower bellows **10**, and the floor of upper bellows **11** are continuous and jointly planar since they are really a single plate while the reed box **15** rides up and down as the

bellows are operated. Accordingly, both bellows are inter-connected by the reed box to produce alternate and contrary operation.

Upper bellows **11** has a rigid fixed top plate **19** provided with an intake valve **20** which serves a similar function as valve **13**. Likewise, the floor of upper bellows **11** is provided with a delivery valve **21** which functions as does valve **16**.

It will be observed that top wall **19** is integral with side walls **22**, the bottom of which are connected to the bottom supporting strips **12***a*. Thus wall **19** and sides **22** form a rigid frame member which supports upper end of bellows **11** in a fixed position, the lower end of the bellows **11** being movable as will hereinafter be made clear, to produce expansion and compression. In order to insure the return of bellows **11** to a compressed condition, a return spring **23** is provided, spring **23** being connected between top plate **19** and the reed top plate **18**. However, ordinarily the player will do so manually through means which will hereinafter be described.

The reed box **15** is essentially of known construction although its specific disposition in combined relation to my bellows arrangement is novel. The reed box **15** is provided with a conventional form of elongated reed block **25**, the underside of which has a series of tuned reeds **26** which may serve the number of octaves required, such as in an accordion or conventional organ. The upper face of reed block **25** is formed with conventional reed slots which are covered or uncovered by the rear hammer **27** of keyboard **28**.

Keyboard **28** comprises the usual series of so called black and white keys. Any conventional form of keyboard may be used. In this application I have shown the keyboard **28** consisting of a series of keys which are connected to a transverse rigid supporting block **29** on the top surface of which is a resilient strip **30** to which the keys are independently cemented side-by-side. Block **29** thus serves as a fulcrum, the keys thereby being mounted to operate in a see-saw fashion, with the keys normally in an upward position, the hammer ends of the keys then being in a reed closing position. A resilient cushioning strip **31** is also provided. It is to be understood, however, that the keyboard system shown is simply representative and may be substituted by a conventional keyboard system. It should further be observed that the keyboard system above described is the subject of a U.S. patent application filed by me on April 29, 1964.

The instrument is provided with a hand saddle **35** which comprises an inverted U shaped rigid frame **36** disposed across the entire instrument and resting upon rigid plate **18** of reed box **15**. A downwardly and rearwardly inclined hand rest bar **37** is approximately medially disposed across frame **36**.

As is noted in FIGURES 2 and 3, the player's hands will be inserted through the transverse space or slot formed by the top bar of the saddle and the hand rest bar **37**. The rear portion or heel of the hand will normally rest upon bar **37** so that the fingers may operate the keyboard as illustrated in FIGURES 2 and 3.

Let us assume that the player desires to compress lower bellows **10** so as to deliver a supply of super-atmospheric air to reed box **15**. The heel of his hand will simply press upon bar **37** of the saddle **35** so as to produce such compression of bellows **10**. At the same time, bellows **11** will be expanded or charged. Of course, the player will usually play a tune by operating the keyboard at the same time, as shown in FIGURE 3. Accordingly, it will be recognized that the player's fingers will select the desired keys at the same time that his hand produces compression of the lower bellows **10** and the required flow of air to the reed box. These actions may be inter-related by the player since he may desire to accompany

the production of any particular note or chord with a forceful or otherwise modulated stream of air, such as a vibrato or the like. All this is made possible because the player's hands are simultaneously controlling both the key selection and the air flow modulation.

On the return stroke, the back of the player's hand will normally be employed against the top bar of the saddle **35** to expand or charge the bellows **10** and compress or discharge the bellows **11**. Thus an alternate and substantially continuous flow of air, through the same direction, is delivered to reed box **15** so that both bellows are served by the one set of reeds as shown.

It will be recognized therefore that the player will reciprocate his hand or wrist up and down to move the keyboard bodily and produce the flow of air while he is playing the tune with his fingers. The entire device is so compact that it may rest on the player's lap or may be disposed on any supporting surface such as on a small table. If desired, the instrument may be secured to such table.

I have shown a preferred embodiment of my invention but it is obvious that numerous changes and omissions may be made without departing from its spirit.

What is claimed is:

1. In an air operated musical instrument having a series of tuned reeds, an air flow system, said system comprising a first bellows, a bodily movable keyboard mounted over said first bellows whereby a player may manually compress or expand said first bellows while he is playing a tune on said keyboard, a second bellows spaced from said first belows and connected thereto whereby said manual operation of said first bellows will effect contrary operation of said second bellows, and a reed box fed alternately by each of said bellows.

2. A system according to claim **1** and wherein said second bellows is disposed rearwardly and upwardly of said first bellows in substantially L-shaped form, the connection of the two bellows comprising a rigid plate which extends across the top of said first bellows and across the bottom of said second bellows, said rigid plate being reciprocably movable to alternately and con-jointly charge and discharge the respective bellows.

3. A system according to claim **2** and wherein said first bellows comprises a rigid and fixed floor, and said second bellows comprises a rigid and fixed top face, said reed box being substantially rectangular and said rigid plate constituting the top face of said reed box whereby said reed box moves reciprocably during charge and discharge of the respective bellows.

4. An air operated, tuned reed, musical instrument comprising a first bellows, a reed box mounted on said first bellows and being bodily movable so as to compress or expand said first bellows, a rigid top plate on said reed box, a keyboard mounted on said rigid plate so as to be movable with said reed box, and a second bellows mounted on said top plate whereby each bellows is alternately charged and discharged by movement of said keyboard and reed box, each of said bellows feeding said reed box.

5. An instrument according to claim **4** and wherein said second bellows is disposed rearwardly and upwardly of said first bellows in substantially L-shaped form, the top plate of said second bellows and the bottom plate of said first bellows being fixed and rigid, and a saddle mounted on said red box and having a hand receiving transverse slot for admitting the hand to permit finger operation of said keyboard, said saddle being rigid to transmit manual forces to said reed box rigid plate for operating both bellows.

6. An instrument according to claim **5** and wherein said saddle is of inverted U-shape, and a rearwardly downwardly inclined rigid transverse bar medially disposed across said saddle to support the player's hand.

7. An instrument according to claim **6** and including a return spring connected from said movable reed box rigid plate to said second bellows rigid top plate.

No references cited.

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