J. Carhart,

Organ Bellows.

No. 4,912. Patented Dec. 28, 1846.

Fig. 1.

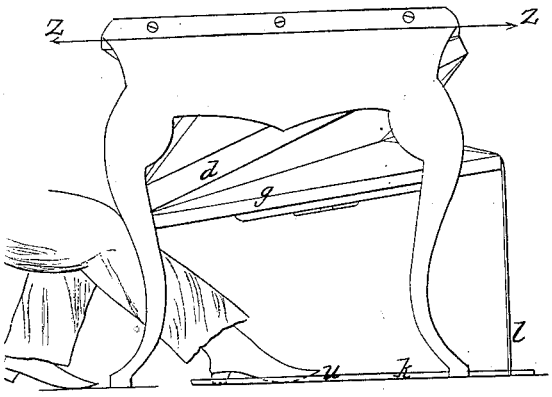


Fig. 3.

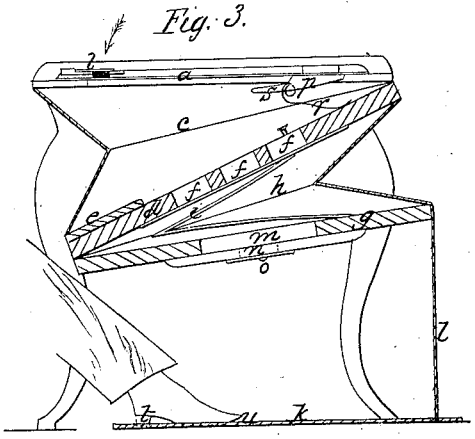
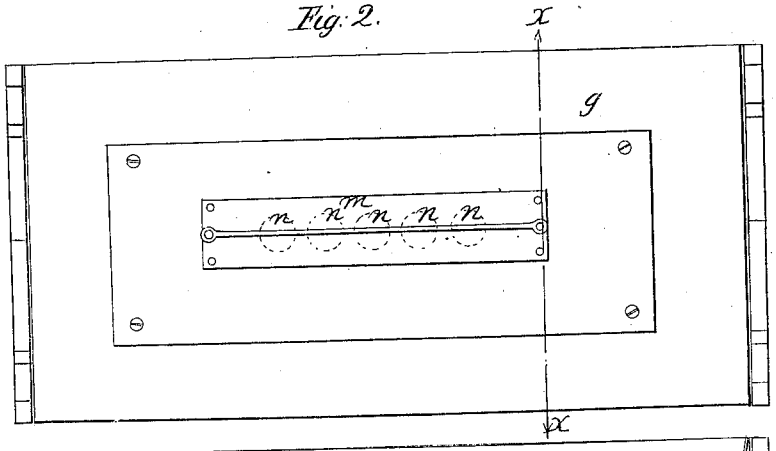


Fig. 2.



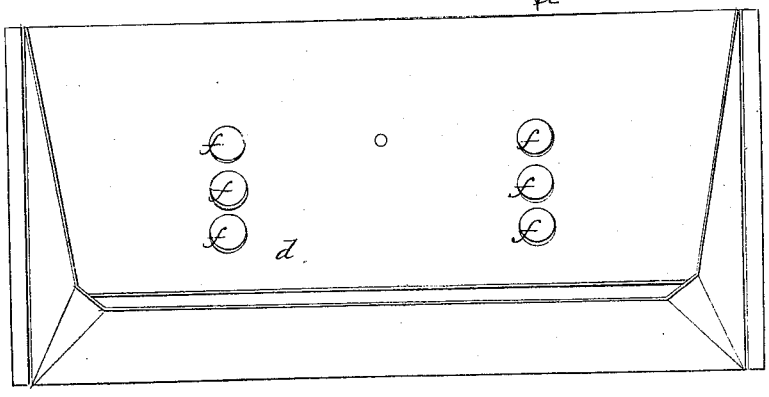


Fig. 4

UNITED STATES PATENT OFFICE.

JEREMIAH CARHART, OF BUFFALO, NEW YORK.

BELLOWS FOR MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. 4,912, dated December 28, 1846; Reissued June 24, 1856, No. 372.

To all whom it may concern:

Be it known that I, JEREMIAH CARHART, of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Bellows of That Class of Musical Instruments Called "Melodeons," "Seraphines," "Aeolian" Attachments, &c., and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an end elevation; Fig. 2, an inverted bottom view; Fig. 3, a vertical section taken at the line (X X) of Fig. 2; and Fig. 4, a horizontal section taken at the line (Z, Z) of Fig. 1.

The same letters indicate like parts in all the figures.

In instruments of the kinds above referred to and all others in which reeds are vibrated by a current or currents of air, the bellows is so constructed as to blow or force the current against the reeds, instead of drawing the current by an exhausting action of the bellows, as in the method adopted by me. The old method requires the employment of what is termed a wind chest (which occupies much room) to keep up a constant current. As in all instruments of this kind the bellows is placed below the reeds the flap of the wind chest must be forced up by a spring the tension of which varies constantly and therefore producing irregular tones, for it is well known that the tones are regulated by the force of the current by which they are produced.

The objects of my invention are to produce a constant current of regular force, except when required to be increased to produce the swell, and so to arrange the parts as to occupy less room than by the modes heretofore practised. These objects I effect by making the bellows with two exhausting chambers; one edge of the flap of the first is hinged to the back of the sound board or table to which the reeds are attached, the other edge is weighted to tend constantly downward and the other chamber is formed by a second or outer flap hinged to the weighted edge of the first flap and provided with a treadle or other means for working it. The first flap is provided with a valve or valves opening into the second chamber through which the air is drawn to exhaust the upper chamber by the operation of the second flap, which latter is also provided with a valve or valves opening outward for the discharge of the air from the second or lower chamber when the second flap is drawn up by a spring that constantly tends to draw it up toward the first flap. And my invention also consists in making the valves of the flap by means of a piece or pieces of thin leather or other suitable or like material, stretched over a hole or series of holes, which piece of leather or other material is prevented from flapping against its seat, after it has been stretched by use, (which produces a disagreeable sound as is well known to all experienced in the making or using of such instruments) by means of a strip or cord of india rubber or other elastic substance over the middle of the valve.

In the accompanying drawings (*a*) represents the sound board or table to which the reeds (*b*, *b*) are secured in any desired or well known manner with the reeds above, so that the tone shall be produced by currents passing toward the bellows. The reeds are placed over apertures in the sound board in the usual manner, leading to the first chamber (*c*) formed by the sound board and the first flap (*d*), which is jointed in any desired manner to the back of the sound board, and connected to the ends and the front by means usually employed in connecting the flaps of bellows. The forward edge of this first flap has a weight (*e*) attached to it which tends constantly to draw it down by an equal force, to give an equal current of air, and therefore to produce a regular vibration of the reeds. This first flap is provided with two series of apertures (*f*, *f*) covered by valves on the under side made in manner to be hereafter described. To the weighted edge of this first flap is jointed the second flap (*g*), the two being connected at the ends and back to form the second chamber (*h*), in the same manner as the first is connected with the sound board. And these two flaps are drawn together by a spring (*i*), one leaf of which is secured to each of them, so that whenever the foot is removed from a treadle (*k*) connected with the second flap by a strap (*l*), this spring draws it right up against the first flap, by

which action all the air previously contained in the second chamber is forced out through a valve (*m*); and when this flap is drawn down by the pressure of the foot on the treadle, the air contained in the first chamber is exhausted therefrom; and as this process of exhaustion goes on the pressure of the atmosphere preponderates over the weight on the first flap and forces it up, so that when the second flap is relieved of the pressure of the foot, the spring immediately begins to draw it up, this relieves the first flap of the pressure of the atmosphere, which acts on it by the intervention of the second flap jointed to it, whereupon the weight begins to descend to keep up the constant and steady action of the air on the reeds.

The manner in which the pressure of the atmosphere acts to force up the first flap, when the first chamber is partly exhausted, will be evident when it is observed that the second flap is drawn down by one edge, the other being jointed to the front edge of the first flap, so that the pressure of the atmosphere on the underside of the second flap tends to force up the two flaps, notwithstanding the back of the lower one is being carried down by the treadle, the connection of the treadle acting merely as a movable fulcrum for the upward movement of the front of the two flaps when forced up by the pressure of the atmosphere.

The valves of the two flaps are formed by a strip of thin leather or other like material secured at each end over a hole or series of holes (*n*) (shown by dotted line in Fig. 2), and then over this leather is stretched a strip or cord (*o*) of india rubber or other similarly elastic substance, which permits the leather to open sufficiently for the passage of the air, but which at the same time prevents the leather from sagging down so far as to flap and make a noise when suddenly closed by the pressure of the air as would be the case after being in use for a short time without the spring.

The upper or first chamber is provided with an escape hinge valve (*p*) opening inward and kept closed by a spring (*r*) but which is opened by the upper or first flap striking the lever (*s*) of the valve when the operator works the lower or second flap faster than is necessary. The treadle (*k*) which cannot be attached to the floor conveniently is cut out, as at (*t*) (as represented by dotted lines in Figs. 1 and 3), sufficiently to permit the heel of the operator's foot to pass through and rest on the floor, to prevent the treadle from being pushed forward when the forward part of the foot acts on the part (*u*) to bear it down.

It will be obvious that other kinds of valves may be substituted for those described without changing the leading part of my invention, and that any other appropriate spring may be employed to draw together the two flaps; and finally that any desired mode of connecting the various parts may be employed so long as the character of my invention or any part of it is retained.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Making an exhausting bellows for reed instruments consisting of two chambers combined with each other and with the reeds placed above, so that the chamber next the sounding board shall be enlarged by a weight on the first flap, substantially as herein described, and exhausted by the action of the second flap, substantially as described.

2. I also claim the method of making the valves by means of strips of leather, or other materials having like properties placed over a hole or series of holes in combination with a cord of india rubber or other elastic substance, substantially as described, whereby the leather valve is prevented from sagging when stretched by use; and making noise by striking the valve seat, as described.

J. CARHART.

Witnesses:
CHS. M. KELLER,
A. P. BROWNE.

[FIRST PRINTED 1913.]