

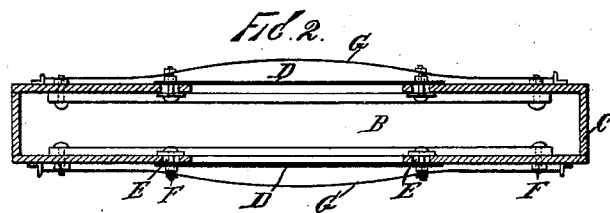
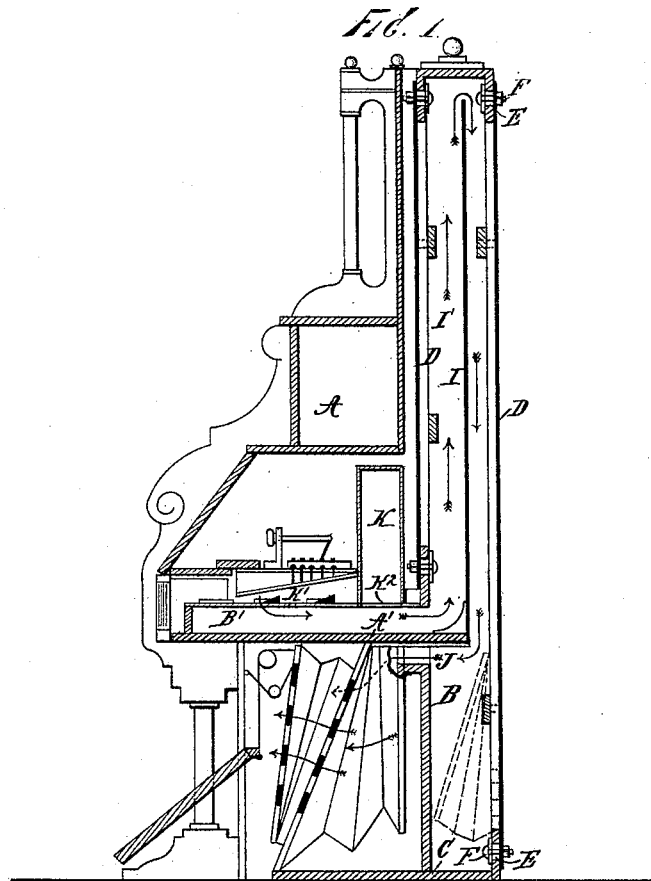
(No Model.)

A. J. REYNOLDS.
REED ORGAN.

2 Sheets—Sheet 1.

No. 523,649.

Patented July 24, 1894.



Witnesses:
John Buckler,
James M. Tully.

Inventor:
Andrew J. Reynolds

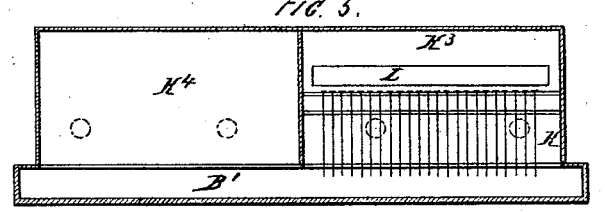
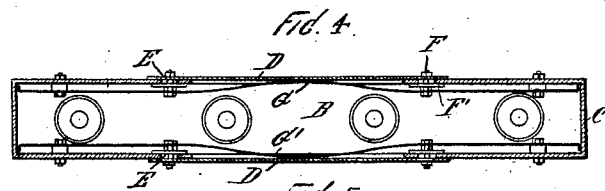
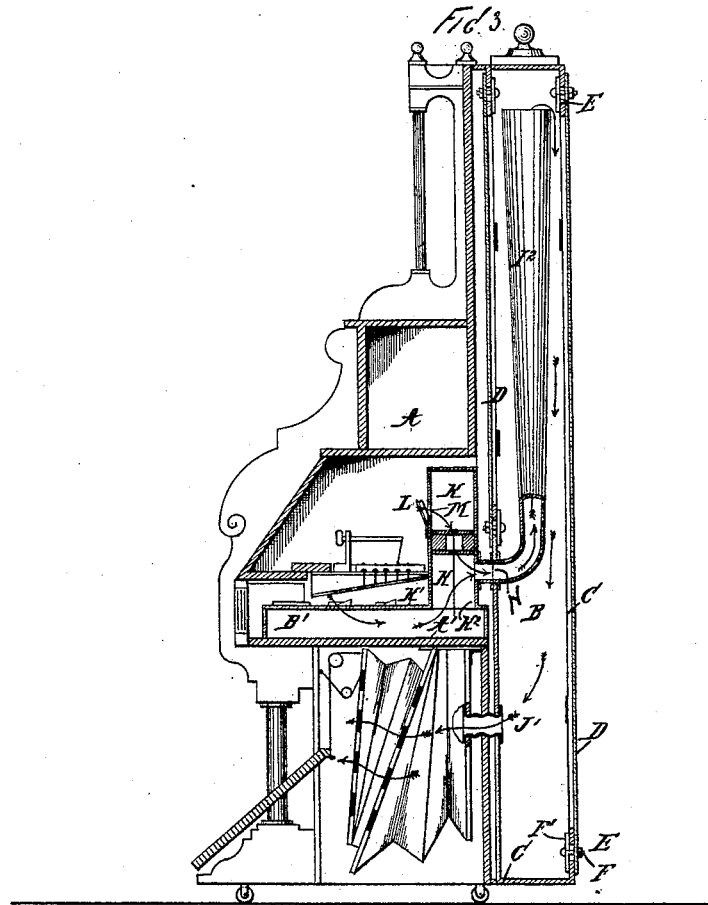
(No Model.)

A. J. REYNOLDS.
REED ORGAN.

2 Sheets—Sheet 2.

No. 523,649.

Patented July 24, 1894.



Witnesses:

John Buckler,

James M. Tully

Inventor.

Andrew J. Reynolds

UNITED STATES PATENT OFFICE.

ANDREW J. REYNOLDS, OF HOBOKEN, NEW JERSEY, ASSIGNOR TO GEORGE
HASELTINE, OF SAME PLACE.

REED-ORGAN.

SPECIFICATION forming part of Letters Patent No. 523,649, dated July 24, 1894.

Application filed May 22, 1893. Serial No. 475,055. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. REYNOLDS, a citizen of the United States, residing at the city of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Reed Organs and other Musical Wind-Instruments, of which the following is a specification.

The said improvements relate specially to reed organs and generally to musical instruments that are operated by exhaust bellows or other exhaust appliances and consists chiefly in the addition to or incorporation in these instruments of vibrators of novel construction and also in the means for connecting said vibrators with the ordinary parts of reed organs or other like operating instruments.

The accompanying drawings show said improvements applied to a reed organ, in which drawings, making a part of this specification—

Figure 1 is a vertical cross section, showing one form of said improvements and a manner of combining the same with the parts of an ordinary reed organ; and Fig. 2 a horizontal cross section of the vertical vibrator as shown in Fig. 1. Fig. 3 is a vertical cross section showing another form of construction and manner of combining said improvements with the parts of an ordinary reed organ, and Fig. 4 is a horizontal cross section of the vertical vibrator as shown in Fig. 3. Fig. 5 is a front elevation of the horizontal vibrator shown in Fig. 3, located within the case of the organ and inclosing the sub-bass suspended in the same.

Like letters refer to corresponding parts in all the figures.

The said improvements are shown applied to a reed organ, A, of the ordinary construction, but they are applicable to all reed organs and by obvious modifications to other descriptions of musical instruments which are operated by the means of exhaust bellows or other exhaust device. The organ, A, being of the usual form, a description of the parts is not necessary to an understanding of the construction and arrangement of said improvements.

The vertical vibrator, B, when attached to

or formed in organ A, becomes a resonant extension of the reed chest B' as well as a part of the passage through which the air and sound vibrations are drawn by the exhaust bellows, the usual air passage through the foundation board A' being closed or dispensed with in the improved instrument. The dimensions of vibrator B should be such as to produce with any given instrument or class of instruments the desired volume and quality of tone. The larger this vibrator as a general rule, the greater the resemblance of the tones to those of a pipe organ, and within reasonable limits, the better the effect. The vibrator B is placed on the back of the organ and should be made sufficiently large to cover the entire back, as shown in the drawings, the ordinary back of the instrument being removed when said vibrator is applied to completed organs and dispensed with when organs are constructed with special reference to this invention.

The shell C of vibrator B is preferably made of thin, resonant wood, but glass, metal or other material or combination of materials may be employed in its construction. The best effects have been attained by the use of well seasoned boards about three-eighths of an inch thick, and this wooden shell is inexpensive. The boards used for the shell may be of uniform or variable thickness or thicker boards may be used as a frame and thinner ones for panels D, as shown in the drawings. These panels are made of thin resonant material and their use is especially desirable in the manufacture of large shells, in which they should be made self-adjusting, in reference to the thicker portions, which they should overlap as shown, by the enlargement or extension of the bolt holes E, as shown in Figs. 2 and 4. The thin panels D are secured to the thicker parts of the shell by bolts F, a washer F' sufficiently large to cover the hole E being placed under the head of the bolt. The object of this construction is to allow for the expansion and contraction of the wood caused by atmospheric changes. A strip of rubber is secured between the overlapped portions of the panels and the other portion of the shell to make air-tight joints. These central panels are made so thin and sensitive

that they are quickly responsive to the lightest notes of the instrument which would not by themselves affect the whole shell, which is vibrated by heavier notes. The thin panels may also be placed to advantage in the bottom, top and sides of deep vibrators.

The shape of the shell C shown in the drawings is rectangular, which is the simplest and least expensive, but elliptic, oval or other shapes may be substituted and it is intended especially in the manufacture of instruments with special reference to these improvements to make the shells of such a shape as will produce the most desirable tones.

The shell of vibrator B should be provided with one or more steel springs, G, G', as shown in Figs. 2 and 4. These springs extend across the back and front of the shell either on the outside or inside the same, as found most convenient. The best effect has been obtained by the use of elliptic springs extending across the shell. When they are applied on the outside as shown in Fig. 2, the ends are secured rigidly at the edge of the shell, but are loose on the bolts F. When they are applied on the inside of the shell as shown in Fig. 4, the ends press against the sides of the vibrator and are allowed motion on the bolts F by an extension of the bolt holes in the springs.

The springs G G' answer the two-fold purpose of sustaining the thin shell when a partial vacuum is produced by exhaustion of air in the vibrator and of automatically producing a strain or tension upon the front and back surfaces of the shell while the instrument is operated, thereby augmenting the resonance of the vibrator and the power of the instrument, proportionately to the power applied to the bellows, the strain or tension being automatically relieved when the playing ceases, which leaves the vibrator in its normal condition, like an unstrung violin or bass-viol.

The shell C may be sustained by spiral springs placed between its front and back and other forms of springs may be used, but those above described have proved the most satisfactory. The sides of the vibrator as a rule being of thicker material and less width than the front and back, require no support, but springs may be applied to the sides in deep vibrators to increase the tension.

The vibrator B may be provided with a partition I, extending across the interior and from the extension of the foundation board A' upward as shown in Fig. 1. This partition forms an air-tight passage I' through which the air and sound vibrations are drawn from the reed chest by the action of the exhaust bellows. The back of the reed chest in this arrangement is removed or partially dispensed with and a corresponding aperture is made in the vibrator and an air-tight connection formed in any convenient manner. This connection may be made by metal, wooden, rubber or paper pipes passing from

the interior of the reed chest to the interior of the vibrator.

While it is desirable to deflect the sound vibrations upward by a partition as shown in Fig. 1, or by pipes I², as shown in Fig. 3, a good result is obtained by a simple passage or large straight pipes extending from the interior of the reed chest into the interior of said vibrator. The passage I' and pipes I² not only elevate and amplify the sound vibrations and thereby produce a better effect, but by increasing the length of the passage between the reed chest and reservoir bellows, prolong and broaden the tones which have heretofore passed directly downward from the reed chest into and been muffled by the bellows. The pipes I² may be made flaring or funnel shaped which will augment and improve the tones, and the shape of the pipes, or the mouth of the pipes, may be varied as found best adapted to produce a pipe organ tone.

The connection between vibrator B and the reservoir bellows may be made by an air passage J into the neck of the bellows as shown in Fig. 1 or by one or more pipes J' as shown in Fig. 3. These pipes are of necessity made elastic or flexible to accommodate them to the movement of the reservoir bellows. The passage J is necessarily indirect and contracted in organs of the usual construction, for which reason the pipes J' are preferable by the use of which the distance between the ingress and egress air ports of the vibrator is increased and the air currents will pass freely and directly into the exhaust bellows without affecting the tones and the power required for operating the instrument will be lessened.

The reservoir bellows may be located within vibrator B as indicated in Fig. 1 by dotted lines or outside of said vibrator, in which case an air port would be made in the shell of the vibrator behind the bellows, or bellows board, to admit air to the bellows, and the egress pipes J' would connect direct with the exhaust bellows located in the usual position or removed and secured to the front of vibrator B, inside or outside the shell. By removing the reservoir bellows, space will be obtained to extend the reed chest downward, as the exhaust bellows of organs are always shorter than the reservoir bellows. Should the exhaust bellows remain in the usual position, the space between the exhaust bellows and the back of the organ may be utilized by an extension of the vibrator, to the front side of which extension exhaust bellows may be secured, thus dispensing with separate bellows board. The location of the reservoir bellows upon the shell of the vibrator may be undesirable, especially in applying these improvements to completed organs as this arrangement would necessitate greater alterations in the instrument.

The vibrations of the shell of vibrator B reinforce the reservoir bellows and in case the reservoir bellows is dispensed with, as has

been done with fairly good results, the space occupied by them will be saved, the cost of manufacture be considerably decreased and the vibrations of the shell be strengthened.

5 A resonant vibrator K, as large as the construction of the organ will permit, may be placed on the reed board K' with one or more large openings K² direct into the reed chest, as shown in Figs. 1 and 3 and detached as in
10 Fig. 5. The vibrator K shown in Fig. 1, which has no openings except into the reed chest, may be used to advantage in organs not provided with vibrator B, in which case the air would be drawn into the bellows in the ordinary
15 manner, but the tones or sound vibrations would be qualified according to the size of the vibrator, which will, in organs that have no sub-bass, in a large measure, produce the effects of a sub-bass. As shown in Figs. 3
20 and 5, vibrator K is divided into three chambers or compartments K² K³ K⁴ by a vertical partition and by the horizontal sub-bass box. The chamber K⁴ is tightly closed except the openings into the reed chest and vibrator B.
25 The closed chamber K³ is provided with a mute or valve L, which opens and closes air port M admitting air through the reeds into compartment K² and out through passages N into vibrator B to the bellows without having
30 passed into the reed chest. As will be seen in this form of construction the sub-bass reed box is removed from the reed board and suspended or secured in the vibrator K as shown. By this arrangement it has been found that
35 the sound vibrations or tones emanating from the sub-bass are both amplified and mellowed, being changed into those of a well voiced pipe organ.

The air and sound vibrations may be drawn
40 into vibrator B entirely through passages N, as shown in Fig. 3, the passage at the back of the reed chest shown in Fig. 1 being closed or both means of exit may be provided in the same instrument. By removing the bottom
45 of compartment K², this compartment becomes a simple extension of the reed chest and by removing the back of this compartment and the back of the reed chest and forming a corresponding opening into vibrator B,
50 the connected area becomes a great vibrating chamber.

These improvements are especially valuable when incorporated in large reed organs designed for churches, halls and lodge-rooms,
55 the effect of their adoption being to produce tones almost identical with those of a pipe organ and to more than double the value of

the instrument without much increase in the cost of manufacture when made with special reference to said improvements. 60

The construction of other like operating musical wind instruments, with these improvements, is not much more expensive than that of the same class of instruments without them, while the best manner of applying
65 these improvements will readily suggest itself to those skilled in the construction of such instruments and the improved instrument will have a greatly increased artistic and commercial value. 70

Having fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A vibrator, B, provided with ingress and egress air ports and tone qualifying pipes
75 substantially as described.

2. A vibrator, B, provided with springs for giving automatic support and tension to the shell as a partial vacuum is produced in said vibrator by the action of the exhaust device,
80 substantially as described.

3. A vibrator, B, provided with self-adjusting vibrating panels for the purpose and substantially as described.

4. A vibrator, K, divided into compartments by a vertical partition and connected
85 with the reed chest by one or more passages, one compartment being sub-divided horizontally by sub-bass box for the purpose and substantially as described. 90

5. A vibrator, K, divided into compartments, one of which is provided with a "mute" valve to admit air to the sub-bass reeds, the other compartments being provided
95 with ingress and egress air passages substantially as described.

6. In a musical instrument provided with reeds and an exhaust device, the combination therewith of a vibrator or vibrating chamber, the sides of which are so constructed that
100 they answer the purpose of reservoir bellows, the air being drawn direct from said chamber into the exhaust bellows, substantially as described.

7. The combination in a musical instrument provided with a reed chest, exhaust and
105 reservoir bellows; of vibrators A and K and air passages connecting said reed chest, vibrators and reservoir bellows substantially as described.

ANDREW J. REYNOLDS.

Witnesses:

JAMES M. TULLY,
J. BAPTIST MARSHALL.