J. R. & S. R. PERRY.

Reed-Organ.

No. 207,438. Patented Aug. 27, 1878.

Fig 2

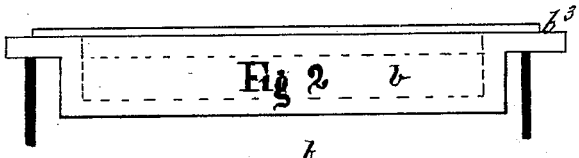


Fig 3

Fig 1

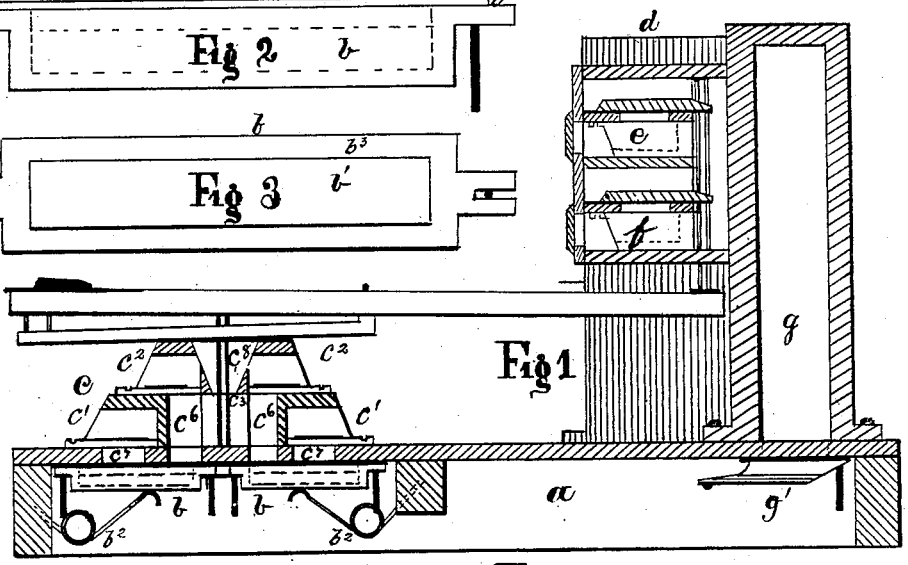


Fig 4

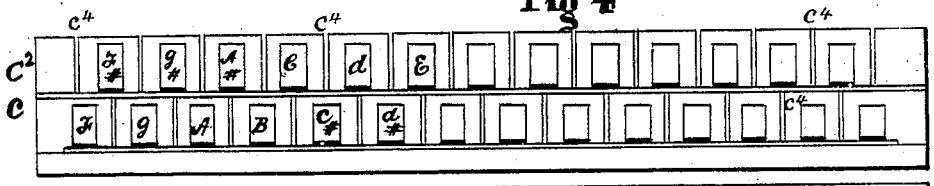


Fig 5

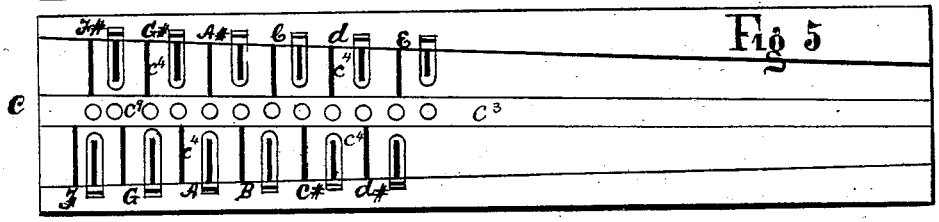
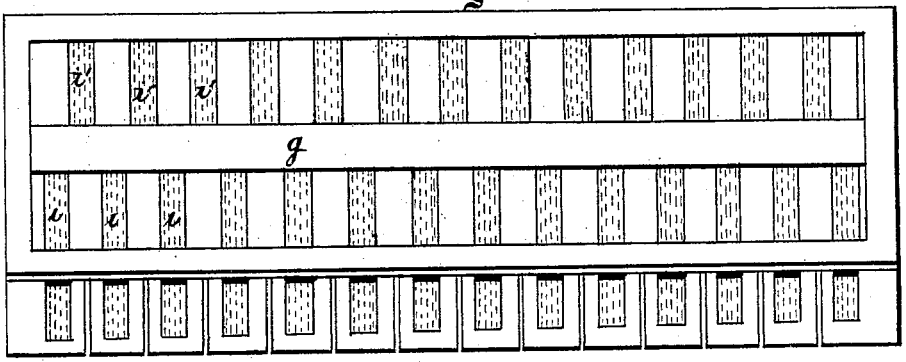


Fig 6



Witnesses.
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Reed-Organ.

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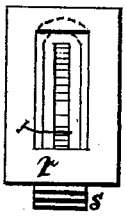
Fig 8



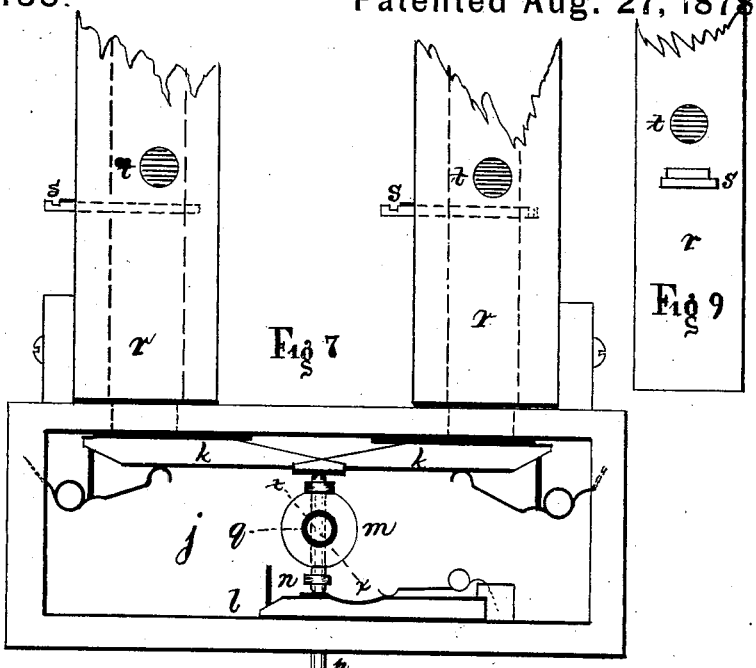


Fig 7

Fig 9

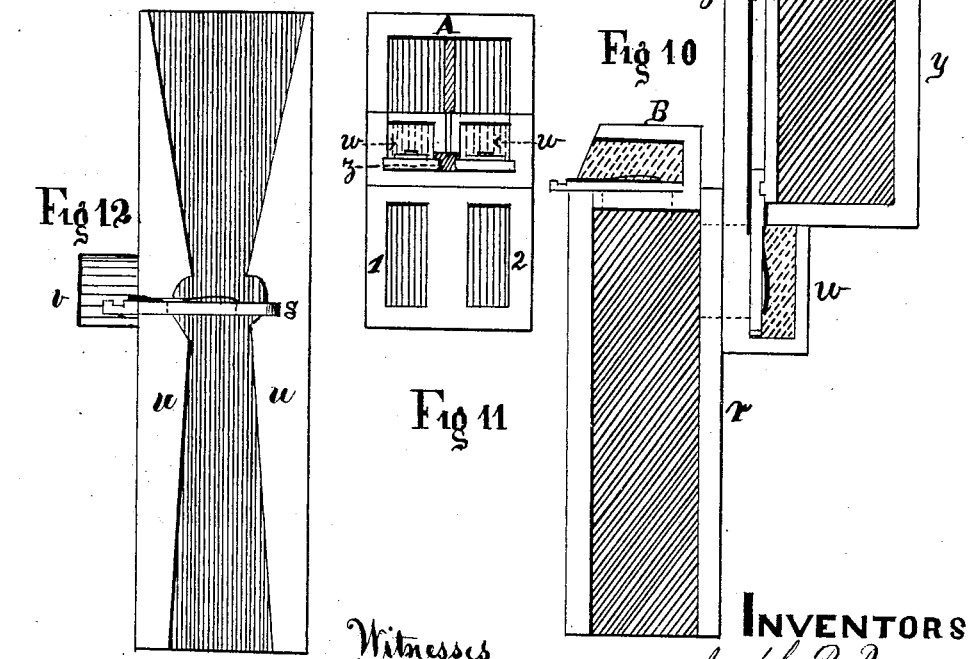


Fig 10

Fig 11

Fig 12

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FIG. 14.

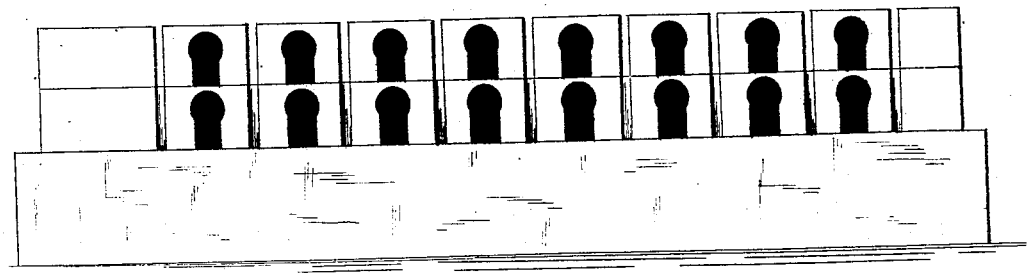
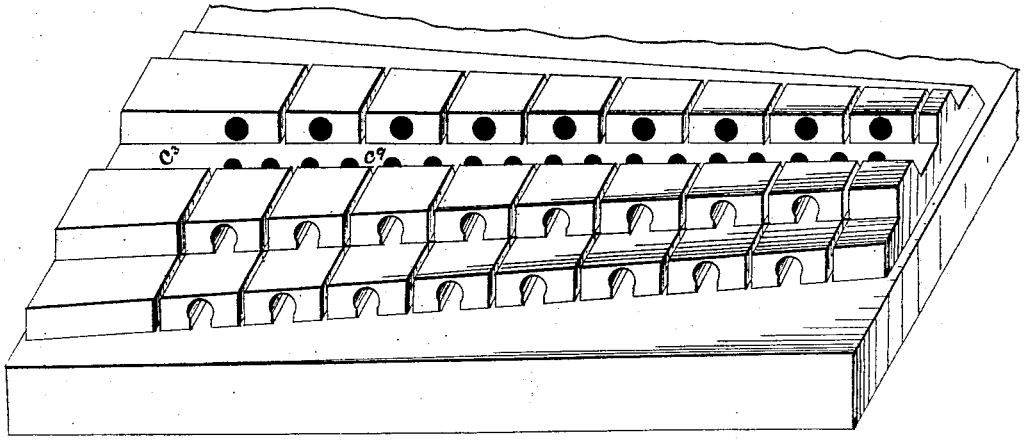


FIG. 13.



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UNITED STATES PATENT OFFICE.

JOSEPH R. PERRY AND SAMUEL R. PERRY, OF WILKESBARRE, PA.

IMPROVEMENT IN REED-ORGANS.

Specification forming part of Letters Patent No. **207,438**, dated August 27, 1878; application filed February 8, 1877.

To all whom it may concern:

Be it known that we, JOSEPH R. PERRY and SAMUEL R. PERRY, of Wilkesbarre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in the Construction of Reed-Organs; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in reed-organs; and has for its object to increase the vibrations and power of the reeds and render the latter more sensitive, of better quality, and so that they yield a greater variety of tone.

It consists in the construction and arrangement of the valves and valve-openings of the reed-board in such manner as to provide much larger openings, whereby a stronger draft of air is secured upon the reeds; in the construction and arrangement of the reeds and reed-cells, as well as the valves and valve-openings, with reference to the key-board of ordinary construction, so that much larger space is provided, which enables us to employ a much larger reed and reed-cell than can be employed in organs of ordinary construction; in such construction whereby each reed and reed-tube is separated from and independent of the reeds next it; in the construction of the valves below the reeds with recesses, whereby less movement of the keys upon the pitman and valves is required to make the reeds speak promptly, and whereby the quality of tone is improved by reason of reed-tongue beating into a space or chamber instead of throwing its pulsations against a surface in close contact with it; and it consists, further, in providing the reeds with air-conductors or long vibrating tubes, which may be of various forms, as desired, into which the reeds are placed, made either singly or combined with the ordinary reed-cell within each vibrating tube and of any desired size; and in other improvements, all of which will be hereinafter fully set forth.

In the drawings, Figure 1 represents a sectional view of part of an organ constructed according to our invention. Fig. 2 is a side view, and Fig. 3 a plan, of one of the valves.

a is the wind-chest, in which are arranged the valves *b b*, springs b^2 b^2, and parts connected therewith. The valves *b* are formed with a recess, b^1, leaving a rim, b^3, which is covered with any suitable packing. This valve, constructed as described, gives an instantaneous impulse to, and therefore quickens, the vibrations of the reeds; and they are suitably hinged, either at their ends or sides, as may be preferred.

C is a double reed-board, composed of the lower and upper boards, c^1 c^2, each placed horizontally, and composed of two or more series or rows of reed-cells and reeds, arranged on opposite sides or front and back of the intermediate pitman-board or holes c^3, as shown in Figs. 1, 5, and 13. This arrangement gives us greater economy of space, enabling us to bank and place more reed-tubes and reeds with their valves in a given space than can be done by any of the ordinary means. The lower board contains one set of reeds—say, diapason—and the upper board contains another set of reeds, by preference keyed an octave higher in pitch.

The boards c^1 c^2 are constructed so that the air-passages of both sets of reeds are both closed by one valve, and accordingly are, by preference, placed in a vertical line one over the other, as shown in Fig. 14, while the chromatic scale of the reeds in both upper and lower boards is placed in two rows, alternating front and back. This peculiarity is illustrated in Figs. 5 and 13, in which is shown reed-board c^1, the reed F of which is placed in front, and F-sharp on the back thereof, and so on for the other letters of the scale.

It is, however, immaterial whether the scale commences from the front or rear side of the board, so long as the reeds are arranged in alternating rows.

The upper board, c^2, is placed immediately over, with its reeds placed slightly in rear of, the reeds in the lower board, c^1, as shown in Figs. 1, 13, and 14, so that the air-passages c^6 are in rear of and independent of the air-passages of the lower reeds, as shown in Fig. 1.

In Fig. 4 another arrangement of the cells of the board c^2 is shown, viz., each cell is

placed the width of itself to the right of and alternating with the cells of the board c^1. This arrangement will cause the reeds to agree with the regular scale as to naturals and sharps, and with an ordinary key-board.

The cells of both the upper and lower boards, c^1 c^2, are separated from each other by cuts c^4, leaving or making an air-space. (Shown more clearly in Figs. 13 and 14.)

The cut c^4 may be extended back through board c^1 to the rear end of the upper row of cells; but with the arrangement of cells shown in Fig. 4 it extends in the board c^1 back to the front end of the cells in board c^2.

The cutting asunder of the cells prevents the vibrations of one reed from affecting the tone of the one next it, thus causing each tone to be distinct and independent of all others.

When the reeds of the reed-boards are placed as hereinbefore indicated, it is necessary to employ an air-conductor, *d*, at each end of the instrument, such conductors *d* being connected with the wind-chest, in order to take the air from the reed-boards *e f*.

We would here explain that while the system of arrangement hereinbefore mentioned of the cells of the board *c* and the cells *e* and *f* in relation to the key-board are the same, the reed-cells *e f* are cut asunder and occupy two distinct rows, one above the other, for each scale of reeds.

At the extreme right-hand end of Fig. 1 is represented another air-conductor, *g*, from the surfaces of which reeds may be vibrated through the tilt-valves *g'* within the wind-chest *a*. This arrangement is fully set forth in Fig. 6, which is a top view, showing the independent reed-cells on the front side and the openings in the air-conductor *g*, which is here shown double, and may be used to take air into the front or back part of the same.

The conducting-chambers *i i i' i'*, &c., are placed alternately to suit the reeds, as already described. They are formed by being cut from a solid plank, or by being glued up in separate chambers, and the reeds worked with a valve for each reed-chamber, as more fully shown by Fig. 7, which is an end sectional view, in which *j* is the valve-chamber, *k k* the valves, supported in the usual way. On the bottom of this chamber we place a supplementary valve, *l*, for each key, for the purpose of preventing any leak from the pitman when exposed to the outside air.

Between the valves *l k* a coupler-bar, *m*, is placed, to hold the connecting-pitman *n*, which is allowed to slide freely, so that when the keys *o* are operated it will raise the valves *l* by means of the other pitman, *p*, and pitman-bar *p'*, which connect the keys and valve *l*. A washer is glued to the top and bottom of the pitman, which runs through the coupler-bar *m*, so as to allow them to slide up and down, while preventing them from dropping out. This bar *m* is supported at each end of the valve-chamber with hinges, or may be pivoted, and will revolve on the centers *q*, so that when desired it may be changed by means of a stop arrangement and placed in the position of the line *x x*, with the pitman taken off the supplementary valve *l*, thus allowing the key *o* to move without opening the valves *k k* when the upper reeds are not to be sounded. The air will be taken off by end or back conductors, as previously described.

In consequence of changing the position of the reeds, as described, and the additional space given, and for the purpose of getting more power and a greater variety of tones, we construct separate and independent vibrating tubes or conductors *r*, which contain the reeds and conduct the air into the bellows.

Fig. 8 is a top view, showing the reed *s* exposed, so as to draw easily in turning.

In the construction of reed-organs many qualities of tone are required. Each scale of reeds or separate set of reeds is made to have a different "voicing." In our device facilities are presented, such as placing the reeds in the tubes *r*, so as to exclude or admit the air; admitting the air from the sides or back, as seen in Figs. 7 and 9; giving the insides of the tubes a variety of shapes and proportions, as shown in Fig. 12, and giving other facilities indicated in the drawings, whereby the tones may be softened and otherwise modified. In Figs. 10 and 11 are shown different ways for placing the reeds.

By throwing the shape wider at the top, as seen in Fig. 12, it will produce a louder tone; and by closing it more it will soften the tone; and by widening the bottom will also produce a stronger tone, by impinging a more compact current of air upon the reeds.

Fig. 10 is a sectional view, the reed and reed-cell *w* being placed on the outside. To this tube *r*, and inclosing the reed and reed tube or tubes, is added the resounding chamber or tube *y*, the air passing from the upper chamber into the tube *r* by an opening near the top, as indicated by dotted lines. Within this upper chamber is a slide or chamber, Z, to admit the reed, and which is made accessible for tuning. This tube or chamber and reed-cell can be made singly or double by placing a strip, A, between each reed and reed-cell, as shown in Fig. 11, which is a top view, showing reed-cells *w w*, and slide or channels Z, and openings Nos. 1 and 2 of the tube *r*.

In Fig. 10, on the top of the tube *r* there may be placed an additional reed and cell, B, which can be modified by an additional covering; and these tubes *r* or tubes and resounding-chamber *y*, when constructed, are arranged in any suitable manner best adapted to suit the organ action. In Fig. 7 they are arranged upon the wind-chamber *j*, through the top of which the valve-openings are cut, as shown by the dotted lines. When the key *o* is pressed the supplementary valve and pitman are forced against the upper valves, *k k*, drawing the air through the reeds and producing the desired vibrations.

The conducting-tubes are packed with leather, and secured by screws passing into them through a longitudinal strip glued to the wind-chamber, as described above, and can be readily combined in an organ with the ordinary reed boards and cells.

The most important principle of our invention is that the length of the tubes and the position of the reeds therein are determined by the size of the valve-openings and the columnar space for air above and below the reeds. The air must be balanced above and below the reeds. If the columnar space above and below the middle of the tube be equal, the reed must be placed in the middle of the tube. If the columnar space above the middle is three times that below, the reed must be placed a distance from the bottom equal to three times the distance it is from the top of the tube. By this method almost any length or shape of tubes or conductors may be employed to vary the power and quality of tone; and as each reed in a descending scale becomes smaller and higher in pitch, so it becomes necessary to decrease the size and length of each tube or conductor in order to give the correct voicing to any given scale. Any desired length of tube may be used, provided the above method of construction and arrangement is observed.

The same tubes or conductors are applicable to the ordinary reed-boards to a limited extent only, because of the peculiar system of continuous notation or succession of tones in the scale and the small valve-openings into the wind-chest or bellows; but they may be used with great advantage for sub-bass reeds or by spreading the reed-boards for solo sets. The independent conducting-tubes *r* and their valves *k* in chamber *j* are intended to be used in combination with the reed-boards C, Fig. 1, or a common reed-board arranged in the ordinary way, and placed immediately on the wind-chest at Fig. 1, when so desired.

For convenience, the valves K are placed at the bottom or under end of the tubes *r;* but it will be readily understood that they may be placed on the top or upper end, and operated by any suitable connecting mechanism.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a reed-organ, the combination of two or more double reed-boards, one arranged above the other, and having their valve-openings and valves placed in alternating positions front and back of the intermediate pitman board or holes, substantially as set forth.

2. A reed-board having one or more series of cells, each cell being separated laterally from the adjoining cells by an air-space, substantially as and for the purposes described.

3. The hollow valves *b*, constructed and operated in the manner and for the purpose specified.

4. In the combination of a wind-chest, *a*, and an air-chamber, *g*, having a series of alternating channels, *i i' i' i'*, the valve *g'*, arranged to be operated substantially as set forth.

5. In a reed-organ, in combination with the reed-board, constructed with alternated valve-openings and valves, as described, of the chamber *j* and the tubes *r*, provided with reeds *t*, substantially as set forth.

6. The combination, with a valve, *l*, of the pitman-hole and coupler-bar within the chamber *j*, substantially as described.

7. The resonating-chamber *y* and tube *r*, constructed as described, and arranged in relation to the reed and reed-cells *w* in the manner substantially as shown in Fig. 10, and for the purpose set forth.

In testimony that we claim the foregoing as our own invention we affix our signatures in presence of two witnesses.

JOSEPH R. PERRY.
SAMUEL R. PERRY.

Witnesses:
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PHILIP MENGOLD.