2 Sheets-Sheet 1.

J. Gilmour,

Reed Organ.

No. 48,881. Patented July 18, 1865.

Fig. 1

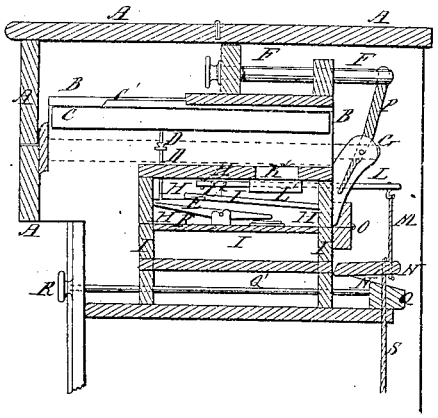


Fig. 4

Fig. 3

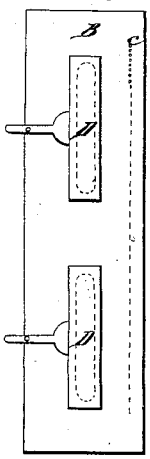


Fig. 2

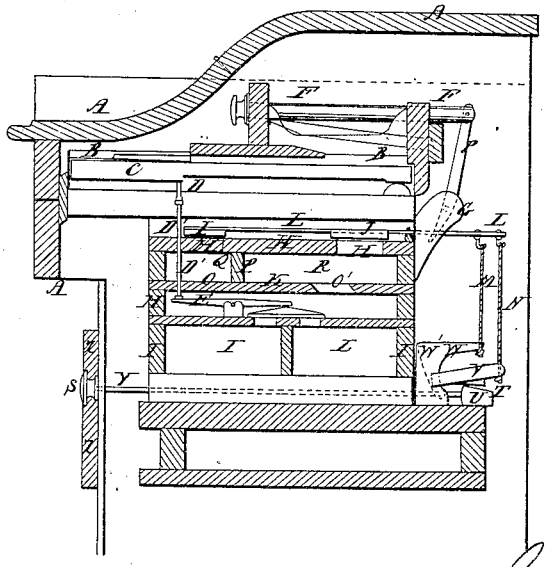


Fig. 5

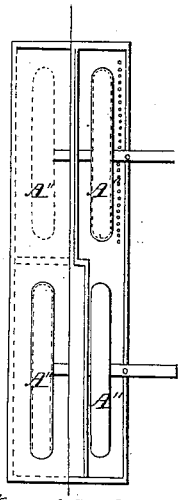
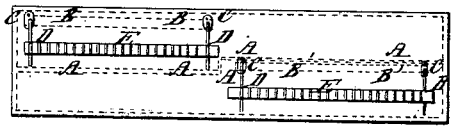


Fig. 6



Witnesses

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2 Sheets - Sheet 2.

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Reed Organ.

No. 48,881. Patented July 18, 1865.

Fig: 1.

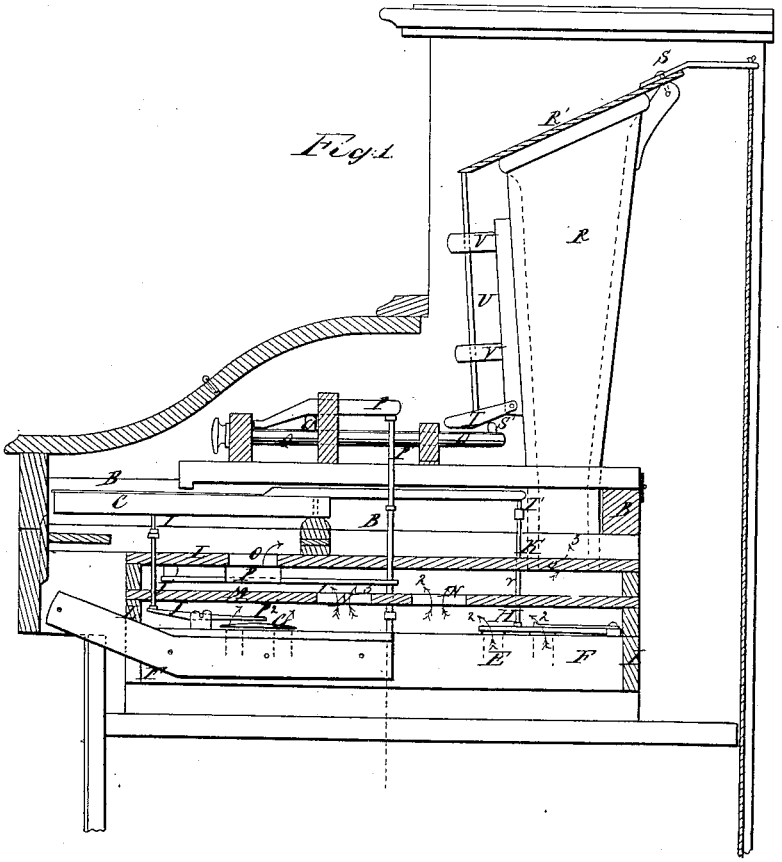


Fig: 2

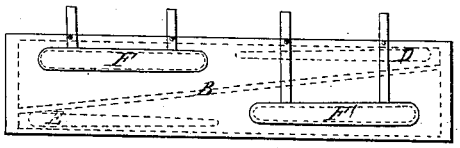
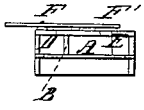


Fig: 3



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UNITED STATES PATENT OFFICE.

JAMES GILMOUR, OF GLASGOW, NORTH BRITAIN.

IMPROVEMENT IN HARMONIUMS.

Specification forming part of Letters Patent No. **48,881**, dated July 18, 1865.

To all whom it may concern:

Be it known that I, JAMES GILMOUR, of Glasgow, in the county of Lanark, North Britain, have invented certain new and useful Improvements in Harmoniums and other Similar Musical Instruments; and I hereby declare that the following is a full, clear, and exact description of the same.

My said invention relates to certain improvements in harmoniums, and has for its object, first, the power of softening and swelling the bass and treble divisions of the instrument independent of each other; secondly, the production of a more refined tone than hitherto obtained, which improvement is produced by causing the sound from the reeds to travel through a greater distance than formerly before being emitted, so as to bring about as near as possible the effect of a sound coming from the pipe of an organ; thirdly, the obtaining of a greater and more effective variety of sound; fourthly, the production of finer-toned instruments at a much lower rate of cost than hitherto.

Figure 1 on Sheet 1 of the accompanying drawings represents a transverse sectional view of one of my improved harmoniums, taken through the treble portion of the instrument. Fig. 2 is corresponding sectional view of a larger and slightly-modified construction of instrument. Figs. 3, 4, and 5 are details, and will hereinafter be more fully referred to.

In Fig. 1 the case of the instrument (marked A) is made, as is usual in ordinary musical instruments of a similar class, of either rosewood, mahogany, or other ornamental timber, and within this case is contained the framework carrying the body or main portions of the instrument.

The part marked B is the key-frame, containing the keys C and C′, in the under part of which the pegs or pins D are fitted, and these, when pressure is communicated to the keys, act upon the stickers D′, which, in turn, pressing upon the pallet-levers E, cause the pallets situated over the reeds to be lifted, when the sound from the reeds immediately follows.

The upper part of the instrument, carrying the row of keys C and C′, together with the stop-battons F, is attached to the lower or under part, consisting of the swell-box and reed-chest, by the hinge-joints G, this frame being secured at the outer end by clamp-hooks and eyes, as usual.

Those portions of the instrument just described and referred to are in no respect novel or original, and consequently form no part of my present invention, my reason for inserting them being to further the complete elucidation of my actual invention, to which I shall now more particularly refer.

Situated immediately below the key-frame is the swell-box H, made by preference of the same length and breadth as the reed-chest I, over or upon which it is situated. The upper portion of the swell-box H is perforated with a row of holes, through which the note-stickers D′ pass in their communication with the pallet-levers E, and extending throughout the whole length of the swell-box H is the slightly-inclined division J, shown in transverse section. Upon more particularly referring to the figure it will be seen that this division does not extend the entire way across the chest in a transverse direction, but at the front part of the swell-box H an opening is left running throughout its entire internal length. This longitudinal opening, (marked K′,) together with that portion of the swell-box beneath the division J, is divided at the center of its length by a piece of wood running entirely across from back to front at the part where it may be determined to separate the bass from the treble, this division of the swell-box H thus effectually separating the bass from the treble portions of the instrument. That portion of the swell-box H situated above the division J is also divided by a central bar situated immediately above the lower one, K, thus cutting off communication between the treble and bass portions, as distinctly shown in the transverse section, Fig. 1 on Sheet 1.

In the upper part or cover of the swell-box H two openings, K′, are formed, one over the treble and the other over the bass end of the instrument, and to the exterior of the swell-box, on the under side of the top, the levers L, carrying the pallets L′, which close over the openings, are fastened by a movable joint, L^2. These levers pass through holes formed in the back part of the box H, and extend to some distance beyond it, their ends being mounted with hooks, attached to which are the strings or cords M, connecting them to the "piano-

swell" lever N, which particular arrangement will be hereinafter more fully described and referred to.

The swell-box H is connected to the reed-chest I in Fig. 1 at its back end by the hinges O, as shown, the front end being secured by clamp-hooks in the ordinary manner, which, when hooked into corresponding eyes, press the material forming the joint between the swell-box and reed-chest sufficiently close together to make it perfectly air-tight.

The stop-batten F is connected at its inner end by a pin-joint to the bent lever P. The lower part of this lever passes through a slot-hole formed in the pallet-lever L, that portion passing into the slot being formed with a shoulder above, so that when the stop-batten F is pulled out by the player, the bent lever P being brought into a nearly vertical position, the distance between its upper end and the pallet-lever becomes greater, owing to the increased virtual length of the bent lever. L is attached, as hereinbefore described, to the piano-swell lever or connecting-bar N by the cord M. This connecting-bar N has formed on its under side the wedge-shaped projection N′, and is fixed by a hinge to the wind-chest, as shown in Fig. 1, the board forming the upper part of the reservoir being extended to some distance in a backward direction, and upon this projecting part the wedge-shaped blocks of wood Q slide, they being fixed to one end of a rod, Q′, passing through the wind-chest to the handle R, which, when pulled, brings forward the wedge-shaped pieces Q, and, owing to these pieces being moved inward or toward the narrowest part of the wedge-formed projection N′, the contact between the two parts Q and N′ is broken.

To the lever N there is fixed an elastic cord or spiral spring, S, and this is connected to the bellows or reservoir of the instrument. The use of a spring or elastic cord is that when the piano-swell is shut or the lever N or connecting-bar is prevented from acting the elastic cord may give way and allow the reservoir to fill. Nevertheless, owing to its elasticity, the spring or cord S is always sufficiently distended whether the bellows are inflated or not, and it is evident that when the pieces Q are moved inward and out of contact with the short levers N the latter are capable of being moved downward when force is applied to them. This moving force exists in the pressure of wind contained in the bellows or reservoir; and it is further obvious that if the lever N is depressed, owing to its being attached by a comparatively inelastic cord, M, to the pallet-levers L, the latter must also be moved downward to a corresponding extent, which movement consequently causes the holes in the upper part of the swell-box H to be opened by the pallets L′ being drawn to a distance from their inner edges. In this arrangement there exists the capability of varying the amount of opening of the pallets L′ by the pressure of wind in and the degree of inflation to which the bellows or reservoir is subjected, so that when the musical tones are emitted through the openings hereinbefore referred to, the power of the tone may either suddenly or most gradually be increased or depressed to the utmost nicety and degree of refinement.

Having now described in detail the various arrangements and systems of mechanism of that modification of my invention shown in Fig. 1, Sheet 1, of the annexed drawings, I shall proceed to point out in what my improvements essentially consist—that is to say: The chief feature of this modification of my said invention consists in applying over the reed-chest I the swell-box H, divided and constructed in the manner hereinbefore described, the result of which is the production of a tone which assimilates very closely to the melodious strains of the organ—in fact, making the harmonium a much more efficient substitute for the latter than what has hitherto been accomplished, owing to the special arrangements of the swell-box H. The sound emitted from the reeds when any of the reed-pallets are lifted passes first up through the front longitudinal opening of that division of the instrument from which it proceeds. Arriving on the top of the inclined sound-board, it escapes through the pallets L of that division of the instrument. Supposing the sound to proceed from the treble portion of the instrument and that the pallet L′ over that portion is open, the sound will be heard modified in tone, owing to its being emitted after having passed through the swell-box; but on the other hand, and if at the time but a low pressure of wind be employed, the softest and almost inaudible musical sounds can be produced. These are capable of being very gradually increased by increasing the pressure in the reservoir by the action of the feet upon the blowing-levers. When the latter is filled to the highest extent possible, by suddenly closing the distant pallet and opening the nearest one the power of the musical tones is swelled to the utmost extent. It is at once obvious that the player can produce at will either the highest power of which the instrument is capable, both in the treble and bass portions simultaneously, or it is equally easy to produce a powerful treble with a very soft and apparently distant bass, and, inversely, a powerful bass with a soft and apparently distant treble.

A second modification of my said invention is that shown in Fig. 2, Sheet 1. As in the former modification, the case A is formed of some ornamental or fancy wood. B is the key-frame, containing the keys, (marked C and C′,) in the under part of which are screwed or otherwise fixed the pegs D. Motion, being imparted to the keys by the pressure of the fingers, is communicated by these pegs D to the stickers D′, and thence to the reed pallet-levers E. The upper part of this instrument, carrying the key-board and stop-battens F, is attached to the body of the instrument by means of the hinges

G, the frame itself being secured at the front end by means of clamp-hooks. (Not shown.) Placed immediately below the key-frame and upper parts of the instrument is the swell-box H, of the same size as and fitting close upon the upper part of the reed-chest I.

In the construction of the swell-box H mainly consists the chief features of improvement in this modification of my said invention; and as most of the details in this arrangement are similar to the one hereinbefore described and referred to, and in some respects similar to instruments of this class as generally constructed, I shall now proceed more particularly to specify the peculiar features of the swell-box H, leaving the details of the knee-swell and piano-swell to be hereinafter referred to.

On referring to Fig. 2, Sheet 1, it will be seen that in the upper part of the swell-box two longitudinal openings, H′ and H², are formed. Over these are situated the movable pallets I and J, connected by the pallet-lever L to the knee and piano swells mechanism by means of the cords M and N. Throughout the entire length of this swell-box H there runs the horizontal sound-board K, having two openings, O and O′, formed, one being in each of its alternate ends and at alternate sides, alternating likewise with the openings H′ and H² in the cover or top portion. Between the cover of this swell-box H and its sound-board K there is fixed a vertical divisional strip, P. This runs in a diagonal direction throughout the entire length of the interior portion of the swell-box, causing the passages Q and R to be narrower at one end and wider at the other. There is also a cross-division in this swell-box, dividing the bass from the treble. When the sound is emitted from the reeds in the bass division of the instrument it can be rendered as soft and pleasing as possible, and in effect is made to appear at a great distance. The reason of this is owing to its having first to travel through the opening O. Its passage is continued along the upper part of the swell-box in that part of it separated by the partition P before arriving at the farther end of the passage Q, which part being of much larger internal dimensions than the end from which it proceeded, the intensity of the sound is decreased in an inverse proportion to the distance through which it has traveled and the difference between the space at first and finally occupied.

In this modification the same remarks apply to the treble division of the instrument, and therefore need not be repeated. The method of acting upon the pallets in the upper part of the swell-box by the pressure of wind in the bellows is similar in this to that described in the former modification; but in this modification they are also acted upon by means of the knee-swell, that portion of which connected to the piano-swell knob S is similar in this to that described in reference to the former arrangement, so that when the two wedge-shaped pieces T and U are pulled at a distance from one another the pallets may be opened by means of the tension imparted to the elastic string connecting the lever V to the bellows or reservoir, or by means of the knee-swell itself, which consists of the cranks W, movable on joints W′, to which the pallet-levers L are connected by means of the cord M. From the lower arm of the crank W there extends a wire or rod parallel to and on the same horizontal plane as the rod Y, and which consequently cannot be seen in Fig. 2. This rod is again connected to the hinged knee-board Z, which projects out when in use from the front of the case of the instrument in such manner that, the knee being applied to or pressed against it, a movement is communicated to the crank W, and thence to the pallet-levers, which, in turn, open the pallets to an extent corresponding to the amount of motion first imparted to the knee-board Z, the quantity of motion of the pallets being regulated by the length of each arm of the crank W and length of the levers L. By these two arrangements of mechanism for regulating the swelling or decreasing of the power of the instrument it is obvious that either the increase or diminution of tone can be regulated at will either by the knee-swell or by the pressure of wind in the bellows or reservoir acting on the piano-swell.

A third modification of my said invention is shown in transverse section at Fig. 1 on Sheet 2. This arrangement is intended to be more particularly applicable to instruments of a larger variety than those hereinbefore described and referred to. The case of the instrument in this as in the former modifications is made of ornamental timber; but, in contradistinction to them, it is made of a different form, having a large portion projecting upward from the body of the instrument. This portion is for the purpose of containing a pair of ducts for modulating the powers of the instrument, and will hereinafter be more fully described.

B is the key-frame, containing the rows of key C and C′. The keys C and C′ are fitted with two sets of pegs, I and I′. Those marked I, toward the front, act upon the front set of pallet-levers J by the intervention of the stickers J′, while the set marked I′ act upon the backward pallet-levers H, also by the intervention of the stickers K′. Above the reed-chest there is placed the swell-box L, of the same length and breadth as the former, and fitting closely over it.

Extending entirely throughout the central horizontal plane of the swell-box L is the sound-board M, in which are formed four openings, N, through which the sound as it is emitted from the reeds passes. In the cover or lid of the swell-box L there are formed four openings, O and O′, two of which are only seen in the accompanying section; but more openings may be used, so as to obtain the full power, when required. The front set of openings (marked O) are closed on the interior by the pallets P, which are acted upon by the stop-battens Q,

acting by means of the projections Q′, when moved, upon the bent lever P, the farther end of which, being depressed as the stop-batten is draw out, causes the pin P′ to move downward, a corresponding movement being imparted to the pallet-lever.

Extending from the openings O′ are the conical R, ducts fitted with the movable lids or covers R′, these being connected to the latter by a suitable movable joint, S. At the farther end of two of the stop-battens, Q, are formed the vertical projections S′, and when the battens are pulled forward these, coming into contact with the movable lever T, cause it to be elevated, and this in turn imparts an upward movement to the sliding rod U, carried in the guides U′. This rod, acting against the lids or pallets, causes them to be also lifted. When it is desired to produce musical tones of a medium power, the pallets P^2 are opened, and the sound emitted from the two sets of reeds passes through the openings covered by the pallets P^2 that emitted from the reeds G passing in the direction indicated by the arrows marked 1, while the sound emitted from the back set of reeds travels in the direction of the arrows marked 2. If it is desired to produce a very soft tone, this is effected by means of closing the pallets P, when the sound, instead of passing through them, is caused to travel first through the openings in the swell-board, passing thence to the large ducts R, and finally escapes at the top through the lid R′, which can be opened to any desired extent by means of the stop-battens, or by means of the cord V, extending to the knee or piano swell and wind-reservoir, as described in reference to the swell-box levers of the last modification. When the sound passes as in the last-mentioned manner its course is indicated by the sets of arrows marked 3. It is obvious that the last arrangement of swell-box and ducts is susceptible of numerous modifications, and, in addition to placing pallets on the top of the chests, they may likewise be placed in the sides and lower portions, thus enabling a sound to be produced not of quite so soft a degree as when issuing from the top.

It is obvious that any of the pallets in the herein-referred-to modifications of my invention may be made movable in many other ways besides those which I have described, and shown in the accompanying sheet of drawings. For instance, they may be constructed to move on a central or end pivot, or to slide around off the openings.

There are also many other methods under which my said invention may be put into practice, and a very simple method of modifying the tone of harmoniums is that shown in plan in Fig. 3 and in transverse section in Fig. 4, Sheet 1. These two figures represent a very simple kind of swell-box, which consists of a rectangular frame, A, covered by a lid, B. This box fits over an ordinary reed-chest, and may be affixed thereto in any convenient manner. The stickers for actuating the reed pallet-levers pass down through the holes C, which are continued along the swell-box in the direction of the dotted line. In the cover of this swell-box two openings are formed, covered by the movable pallet D. They are connected with the bellows or reservoir by cords, as in the former modifications, or may be actuated by stop-battens and a lever arrangement. In this simple modification the cross-division between bass and treble may or may not be used. By means of these pallets a great variety of tone is capable of being produced. By opening the bass-pallet the sound emitted from both the bass and treble divisions of the instrument escapes at the bass-opening, thus producing a powerful bass with a soft treble, and on closing the bass-pallet and opening the treble one a soft bass with a powerful treble is produced, while when both pallets are opened the full power of the instrument can be at once produced.

Another modification of swell-box is that shown in half plan and horizontal section, Fig. 5, Sheet 1. This box is intended to be placed upon the divided reed-chest, Fig. 6, in which the bass and treble portions are separated by the longitudinal division A. (Shown in dotted lines.) The position of the two sets of reeds in this figure is delineated by the dotted lines B and B′, situated at alternate sides of the front and back portions of the chest. Pallets C are shown at the extremities of the reeds, with their levers D movable in the lever rest or rack E. The swell-box, Fig. 5, to fit over this reed-chest has four pallets, A″, by means of which, coupled with the divisions contained in it, the sound is modified to any extent—from the softest and apparently most distant sound to the full power of the instrument. This arrangement, being a modification of that hereinbefore described and more particularly referred to, need not be more fully specified, as it is evident by the general arrangement of this swell-box and reed-chest shown in Figs. 4 and 5, Sheet 1.

Another modification of swell-box is that shown in Figs. 2 and 3, Sheet 2, of which Fig. 2 is a general plan and Fig. 3 a transverse section taken through the treble half of Fig. 2. In this arrangement the box is divided horizontally by the sound-board A, Fig. 3, and vertically in the lower half by the divisional strip B, (shown in dotted lines, Fig. 2,) thus separating the bass from the treble, while that portion between the sound-board and top of the box is divided by the diagonally-situated portion B, Figs. 2 and 3. In the sound-board two openings, D and E, are formed, one in each half at alternate sides, while pallets F and F′ are placed over openings in the lid or cover, alternating with the openings D and E. This last-mentioned arrangement corresponds very closely with that described in reference to Fig. 2, Sheet 1, the difference, which is slight, chiefly consisting in the constructive detail.

It is obvious that most of the foregoing ar-

rangements of swell-boxes can be applied to harmoniums of ordinary construction already in existence, when nearly the same improved effects are produced as in an instrument originally made with my invention applied thereto.

I claim—

The arrangement and construction of musical instruments substantially as hereinbefore described, or any mere modification thereof.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES GILMOUR.

Witnesses:
W. JOHN VINCENTORY,
JOHN BROWN.