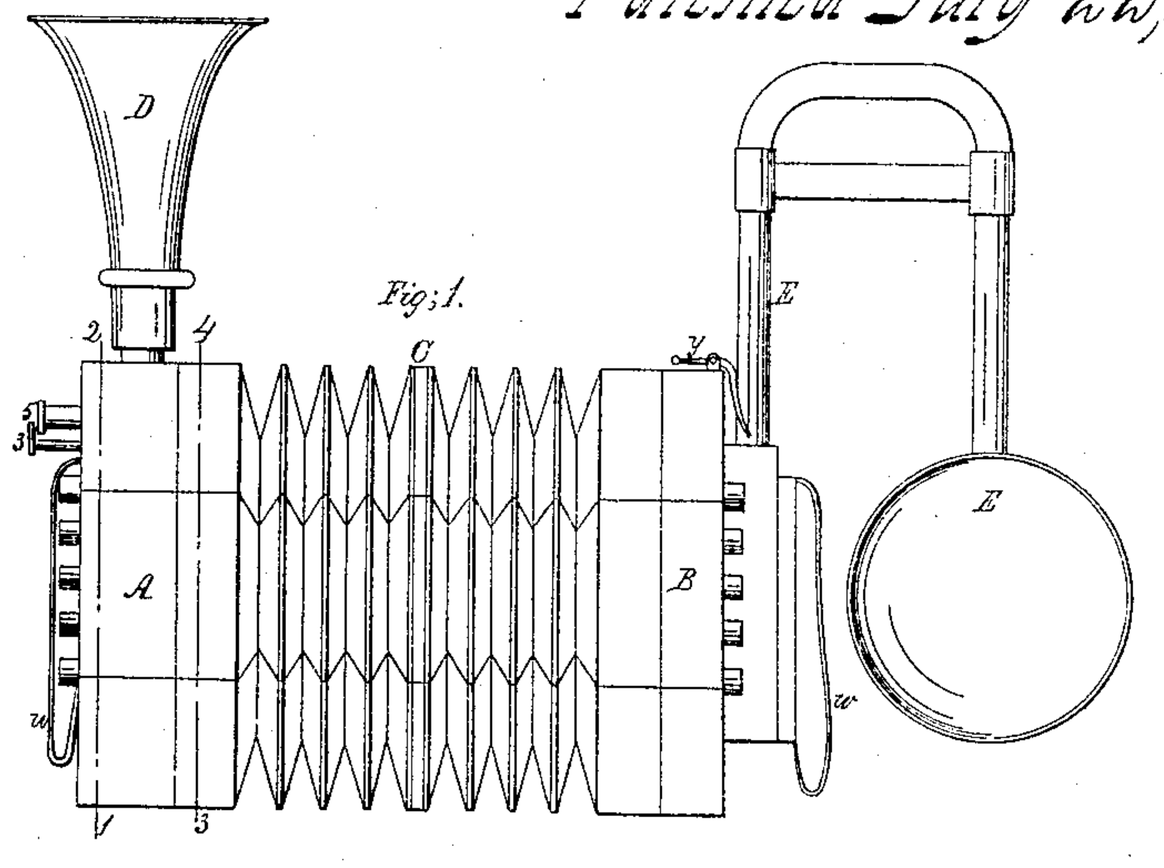
C. M. Zimmermann,

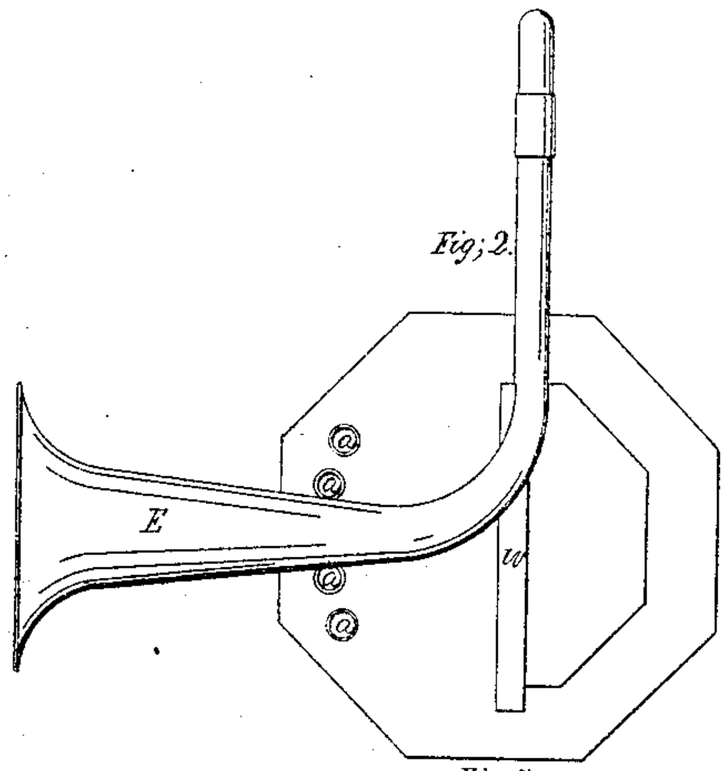
2 Sheets-Sheet 1.

Accordion.

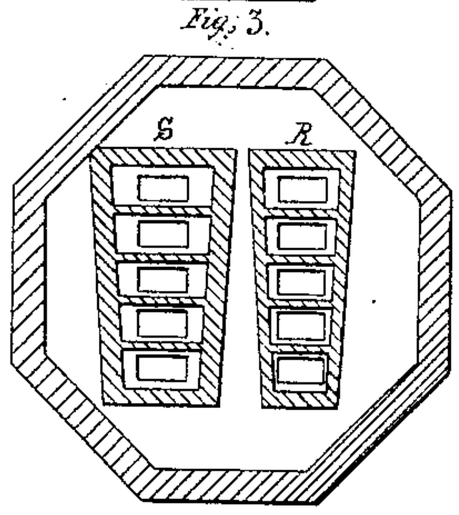
No. 15,401. Patented July 22, 1856.



Fig; 1.



Fig; 2.



Fig; 3.

Witnesses.
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2 Sheets. Sheet 2.

C. M. Zimmerman,

Accordion.

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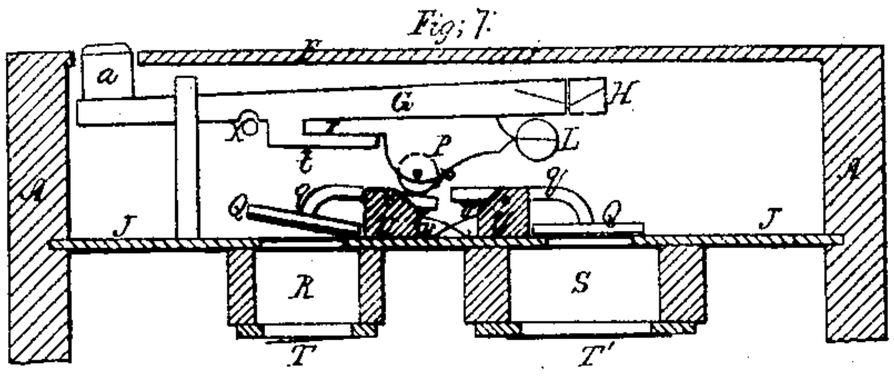
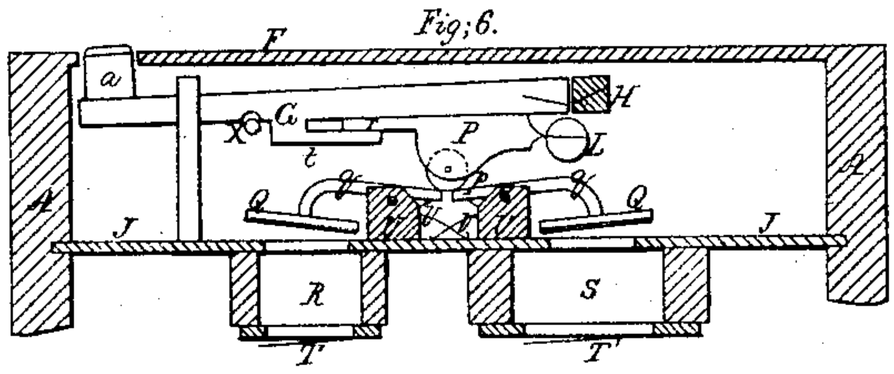
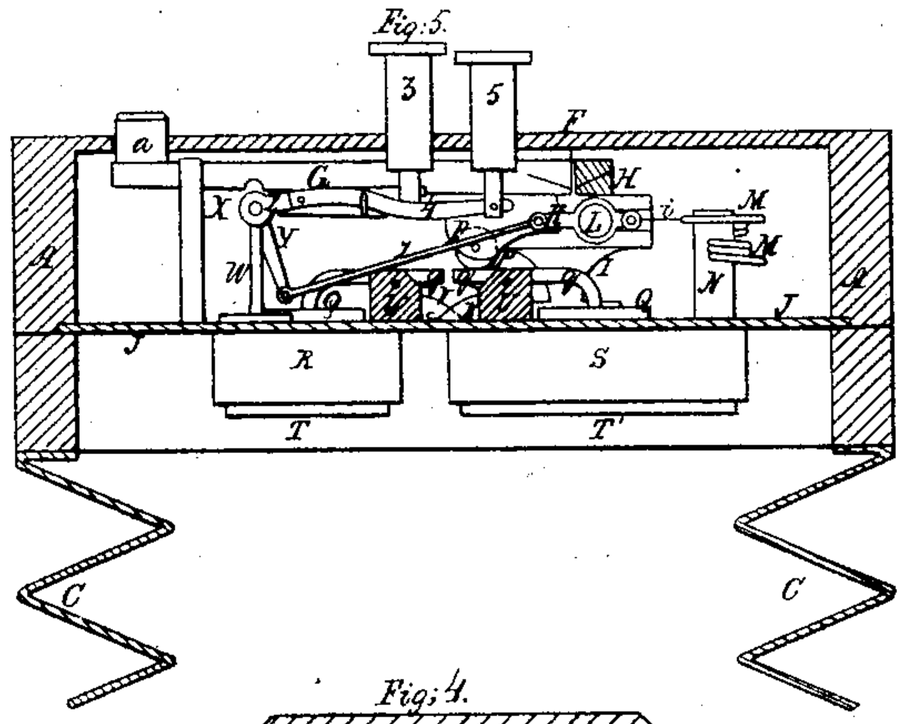
Fig; 7.



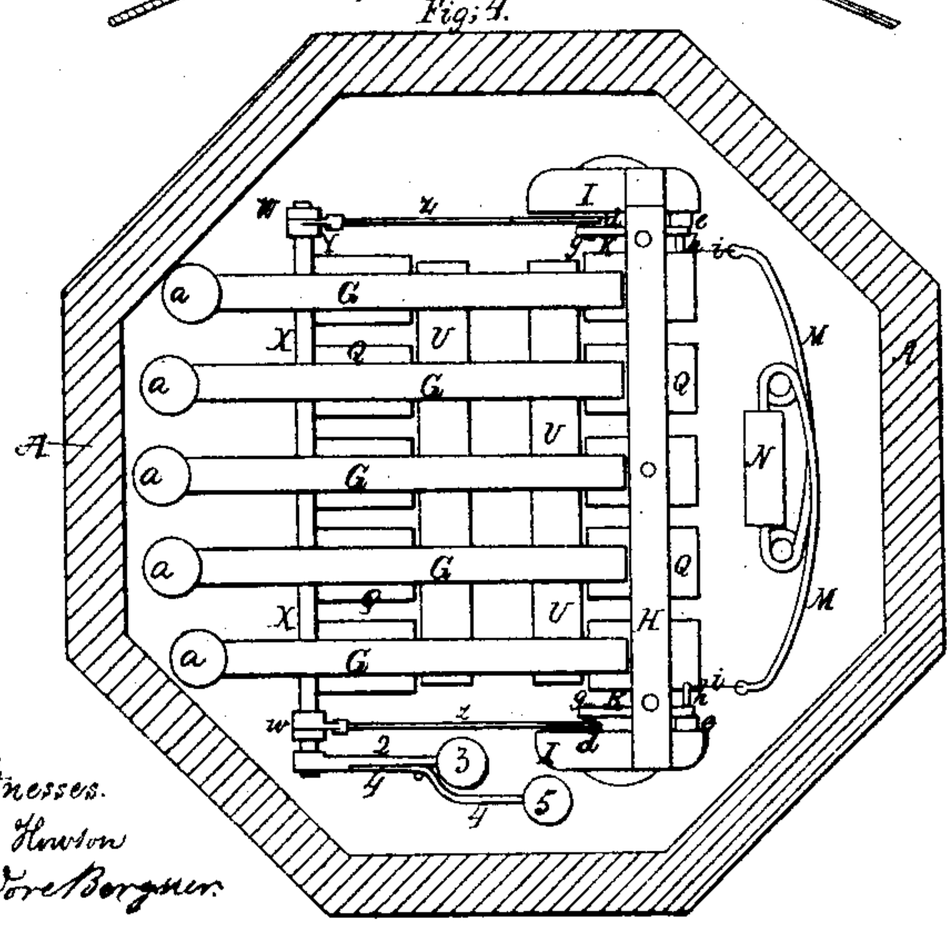
Fig; 6.



Fig; 5.



Fig; 4.



Witnesses.
Henry Howson
Theodore Bergner.

Inventor.
Charles M. Zimmermann.

UNITED STATES PATENT OFFICE.

C. M. ZIMMERMANN, OF PHILADELPHIA, PENNSYLVANIA.

VALVE OF ACCORDIONS.

Specification of Letters Patent No. 15,401, dated July 22, 1856.

To all whom it may concern:

Be it known that I, CHARLES MORITZ ZIMMERMANN, of the city of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Accordions, Concertinas, and other Similar Instruments; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the figures and letters of reference marked thereon.

My invention relates to improvements in that class of musical instruments, in which sound is produced by air forced by means of bellows against a series of reeds, such as accordions, concertinas, and melodeons and consists in arranging the valves of the above mentioned instruments in connection with sliding rollers acted upon by the keys, and regulated by stops, in such a manner that by pressing the stops the said sliding rollers may be passed from one valve to another or brought to open two valves together thereby enabling the operator by pressing one key to produce a variety of different notes.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the drawing which forms a part of this specification, Figure 1, is an external view of a concertina drawn to a scale of one half the actual size, and illustrating a portion of my improvements. Fig. 2, is an end view of Fig. 1. Fig. 3, is a transverse section on the line 3, 4, showing the compartments for the various reeds. Fig. 4 a transverse section (full size) on the line 1, 2, (Fig. 1) and showing the keys, valves, and stops. Fig. 5 a transverse section of Fig. 3 illustrating the action of the stops on the keys. Figs. 6, and 7, also sections of Fig. 3 and showing the manner in which one of the keys may be made to operate two valves together or each separately by the action of the stops.

The same letters of reference allude to similar parts throughout the several views.

A is the box containing the reeds for imparting (by the action of the bellows C,) the higher notes; B, the box containing the reeds for the lower or bass notes. To the box A I attach a short trumpet shaped tube D, somewhat similar in form and size to the end of a common clarionet, and to the box B another tube bent and terminating similar to a portion of a cornet a piston. These tubes are so arranged that all the air admitted to or discharged from the bellows has to pass through them, except when a special air key *y* is used.

On reference to the full sized sectional views 4, 5, 6 and 7 G are the keys having at their ends nibs *a* which project through openings in the cover F. These keys are attached to the cross bar H by strips of leather or other suitable substance, and the cross bar is permanently secured to the columns I which are attached to the partition J, the latter separating the box A from the bellows C. On the tops of the columns I are longitudinal grooves into which fit the rollers *d* and *e* running loose on their respective pins *g* and *h*, on the bars K, which are secured one to each end of the cylindrical bar L. The pins *h h* are connected to the ends of the springs M, M, by means of the wires *i i* in such a manner that the said springs (whose coiled ends are attached to the block N on the partition J) have a tendency to keep the bars K K, with the cylindrical bar L in the positions shown in Figs. 3 and 4 when not otherwise withdrawn as hereafter described. To the cylindrical bar L are jointed by means of strips of leather or other suitable substance the pieces P, each piece being situated immediately under each key, and having small rollers *p* which operate on the bent arms *q* of the valves Q in a manner hereafter shown. Each of the pieces P has a projection *r* which fits easily into the space formed by the projecting piece *t* under each of the keys G. Underneath the partition J are secured two rows of compartments R and S and below these compartments are the plates T and T′. In the latter are oblong openings containing the reeds, there being two reeds of different notes to each compartment, one of them giving out one note when the bellows are compressed, and the other another and different note when the bellows are expanded.

This arrangement of reeds does not essentially differ from those of all accordions and concertinas, and is too well understood to need further description here. It should be understood however that the reeds communicating with the row of compartments S in this instance are arranged to produce the same notes as those of the compartments R. Those of the latter however are tuned an octave higher than those of the former. Each compartment in the rows R, S has an opening in the partition J and each opening is furnished with a valve Q with bent

arms *q* having their fulcrums in the blocks V which are secured to the partition J. The arms *q* of the opposite rows of valves project toward and nearly touch each other and each projecting arm has a small wire spring V which tends to keep the valve down on the opening when not otherwise raised.

W, W are standards in the top of which the spindle X is allowed to turn freely. Each end of this spindle is furnished with a lever Y which is connected to the pin *q* on each of the bars K by the opposite rods Z (Fig. 3). On one end of the spindle X is secured the lever 2 on the end of which is the stop 3 passing upward through the cover F of the box. To the lever 2 is jointed another and longer lever 4 connected to a stop 5 also passing through the cover F. The lever 4, as long as the lever 2 remains undisturbed, rests on a projection from the latter lever, so that on depressing the stop 5 as far as the button on the top will allow the spindle X and its levers Y are moved a limited distance, and on depressing the stop 3 to its utmost extent, the projection on the lever 2 leaves the lever 4 (being independent of the same) and moves the spindle X and its levers Y to a greater distance.

Operation: The instrument being arranged with its trumpet shaped tubes as shown in Fig. 1, the player passes his hands through the straps *w* at each end, and at the same time as he expands and contracts the bellows plays with the ends of his fingers on the nibs *a* of the keys.

The stops 3 and 5 are so situated on the box A of the instrument as to be within reach of the thumb of the player who is thus enabled to push down the stops without interfering with the other operations. When the works of the instrument are in the position shown in Figs. 4 and 5 with both stops up, the player by passing down the ends of the keys causes the rollers *p* of the pieces P to raise the valves which cover the openings into the row of compartments S causing the air compressed from the bellows to act upon the reeds so as to produce one set of notes and on expanding the bellows causing the air to rush toward another set of reeds, producing another set of notes so that the 5 keys are capable of producing ten different notes. In this respect the instrument does not differ from other accordions and concertinas. Should it be necessary however for the player to produce by actuating the same set of keys a set of ten notes different from the former the thumb is placed on the stop 3 so as to press down the latter until the button on the top touches the cover F of the box. This depresses the lever 2, partially turns the spindle X and causes the levers Y to pull the cylindrical bar L with the pieces P to the position shown in Fig. 7, when the depression of the keys causes the roller *p* to act upon the valves which cover the openings into the series of compartments R, enabling the player to produce a set of ten notes one octave higher than those which were previously given out as long as his thumb depresses the stop 3. Immediately on the latter being released the springs M cause the bar L with its pieces P to resume its former position as seen in Fig. 5. Should the player desire to produce a double set of notes at the same time and by actuating the same keys as before, the stop 5 is depressed until the button on the top touches the cover F of the box, this through the lever 4 catching on the projection of the lever 2 causes the levers Y to draw the bar L and pieces P to the position shown in Fig. 6 so that the rollers *n* may act on the arms *q* of both valves which cover the openings in both sets of compartments, R, S. It will be thus seen that with the five keys shown in the drawing thirty distinct tones may be produced by the simple pressure of the stops 3, 5.

In the larger class of instruments I have three rows of 5 keys each by which I produce ninety distinct tones, enabling me to perform the most elaborate concerted music.

The box B at the opposite end of the instrument may be arranged internally in a similar manner to the box A although so great a variety of bass notes is not necessary.

By causing the sound to pass through the tubes D and E tones of greater harmony and volume are produced enabling even a small instrument to be heard distinctly in a large room.

Although I have shown my improvements as applied to a concertina, I wish it to be understood that I do not desire to confine them exclusively to that instrument as the same may with but slight alteration and without essentially departing from the arrangement described, be applied to accordions, melodeons, and other similar reed instruments.

What I claim and desire to secure by Letters Patent is—

The arrangement of the valves of the above mentioned instruments in connection with sliding rollers acted upon by the keys and regulated by stops substantially in the manner herein set forth for the purpose of producing from the actuating of one key a variety of different tones by the simple pressure of the stops.

CHARLES MORITZ ZIMMERMANN.

Witnesses:

HENRY HOWSON,

THEODORE BERGNER.