

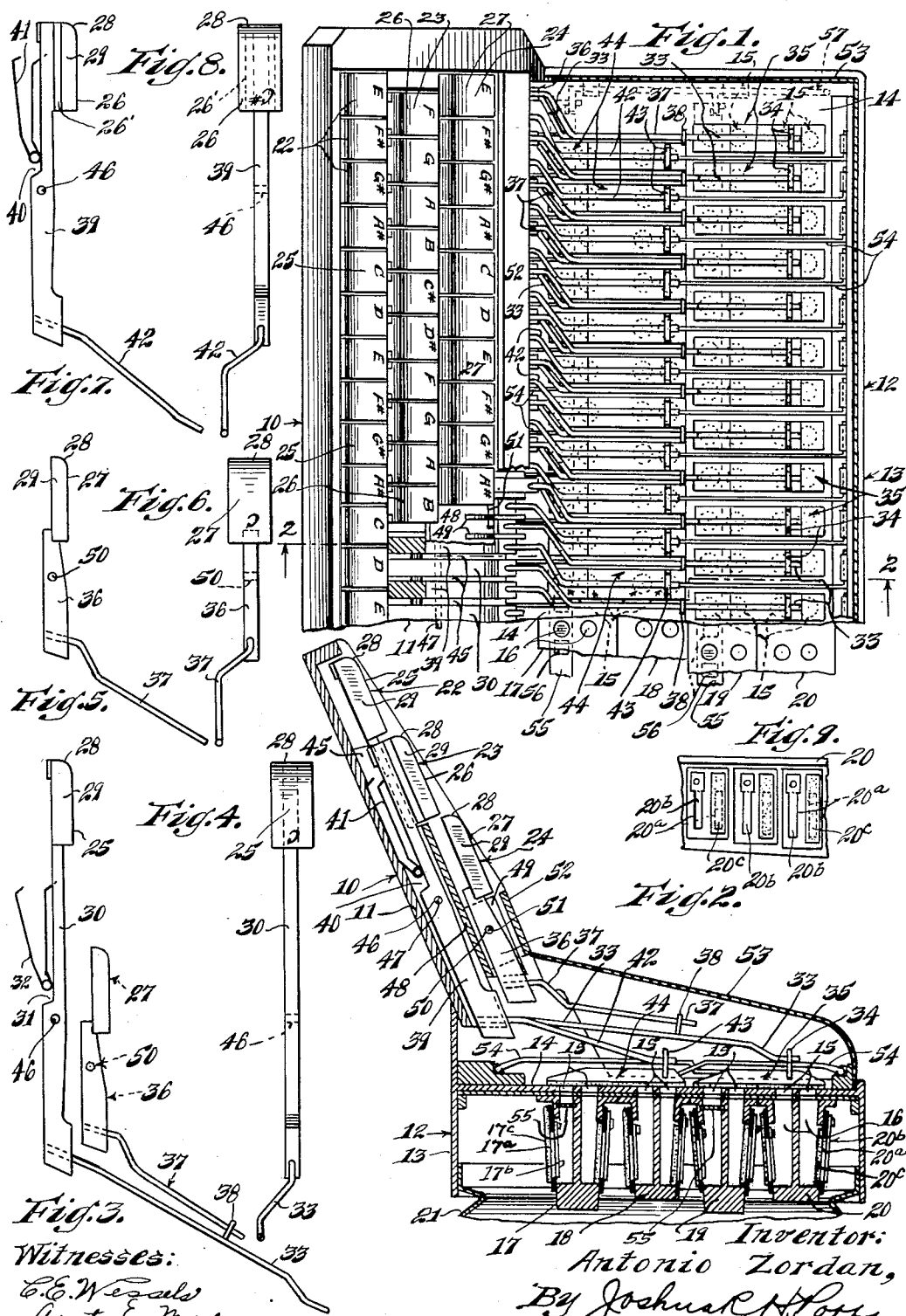
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ACCORDION

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ACCORDION

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My invention relates to improvements in accordions. An object among others has been to provide an accordion whereby one is enabled when playing any scale in its original key to transpose into another key without the need of changing the position of the fingers. Another object is to provide an accordion whereby one can play pieces having higher or lower notes without the need of arranging them. Another object has been to provide an accordion not only having means for accomplishing the aforesaid and other results, but also an improved key whereby fingers may easily glide from an outside key to a middle row or top row key without interference.

Heretofore accordions, especially those involving three rows of keys with a different note for each key, have been found more or less complex, especially for persons in the learning stage, and this has been among the principal reasons why accordions are not more popular. By means of my simple arrangement whereby transposition is made a mere matter of mechanics instead of one involving memory and thought and theoretic training, it is believed that the same will contribute immensely to increase the popularity of accordions not only for skilled players but also for persons beginning to play.

Another object of my invention has been to provide a structure of the kind described which will not only be simple but which will be simple to manufacture and which will be relatively low in cost.

Other objects will appear hereinafter.

My invention may be best understood by reference to the accompanying drawing, in which:

Fig. 1 is a plan view of a keyboard and an elevational view of the accompanying valve structure of one end of the structure;

Fig. 2 is a sectional view on the line 2-2 of Fig. 1;

Fig. 3 is an elevational view of one side of one of the keys of the first or outside row of keys and connected parts, with an elevational view of one side of the keys of the third or inside row of keys shown showing the means for operation of one reed by either of said keys;

Fig. 4 is a face view of one of the keys shown in full line in Fig. 3;

Fig. 5 is a full line elevational view of one of the keys shown in dotted lines in Fig. 3;

Fig. 6 is a face view of the keys shown in Fig. 5;

Fig. 7 is an elevational view of one side of one of the keys of the second or middle row;

Fig. 8 is a face view of the keys shown in Fig. 7;

Fig. 9 is a partial view showing the reeds and leathers.

The preferred form of my invention which has been selected for purposes of illustration to show the principle and the application thereof is shown applied to a conventional keyboard frame 10 having a keyboard compartment 11 and a reed and valve compartment 12. The reed compartment 12 is bounded by a four-sided wall 13 and a valve seat plate 14 having port holes 15 which communicate with air chamber 16 in conventional reed holders 17, 18, 19, and 20. Each reed holder comprises a plurality of independent cells, and each cell is provided with a pair of reed openings 20a as shown in Figs. 2 and 9, and as is well known, one of each pair of openings 28 is provided externally with a reed 20b, and the other opening of the pair of openings 20a is provided with a leather 20c. As shown in Fig. 2 said opening 20a which was provided externally with a reed 20b is provided internally with a leather 20c. The opening which was provided externally with a leather 20c is provided internally with a reed 20b, the reeds being used for the passage of air and the leathers being used to seal as will be readily understood by those skilled in the art. The arrangement is the same for each cell and is also illustrated by numerals in the case of reed holder 17 where the opening 17a has a leather 17c externally and a reed 17b internally. It will thus be seen that on the "pull" movement, when the bellows is being extended, air will enter circular port holes 15 and will operate the internal reed in the cell and cause the leather for the same opening and reed to open to allow air to pass into the bellows. At the same time, the internal leather 20c will seal the other of the two openings. The reverse will take place on the "push" movement, when air is being expelled.

It will also be understood, as is clear from Fig. 9, that the sizes of the openings, reeds, leathers, and cells will be graduated to produce various notes. However, reed holders 19 and 20 are substantially the same, there being four cells for each note for added volume, as will hereinafter more fully appear, that is, the reed holders 19 and 20 have openings, reeds, leathers, and cells which are graduated in the same way. The reed holders 17 and 18 are the same as the reed holders 19 and 20 except they are graduated in a different way in respect to openings, reeds, leathers, and cells to produce notes different from reeds 19 and 20. That is to say, 17 and 18 are like each other, but both are different from 19 and 20, as will be understood by those

skilled in the art and as will more fully appear hereinafter. The wall 13 is attached to the usual bellows 21 as shown in Fig. 2.

The keyboard compartment 11 is provided with a row 22 of keys which may be termed the first row, another row 23 of keys which may be termed the second or middle row, and still another row 24 of keys which may be termed the third or innermost row; the keys in row 22 being designated for purposes of convenience by numeral 25, the keys in row 23 being designated by numeral 26, and the keys in row 24 being designated by numeral 27.

I claim no invention in the foregoing parts individually, such as, for example, the keyboard frame, the compartments, and the individual reed holders. However, among other things I do claim invention in the arrangement of the pairs of reed holders as described and in the arrangement of the keys, and also in the structure of the keys. All the keys have relatively broad striking surfaces, and have rounded front edges 28 and straight sides 29. In this way it will be seen that a finger may easily pass from a key in the outside row 22 to a key in the middle or innermost rows by following the curved edges 28. This arrangement has manifest advantages over other keys provided with the usual forward projections or flanges.

As above stated, I have provided by my invention means whereby the keys in the rows 22 and 24, that is the innermost and outermost rows, will operate the same valves; that is, as will be noticed from Fig. 1, the end key, marked E, in the row 22 and the end key, marked E in the row 24, will operate the same valve. On the other hand, the keys of row 23 will not be able to operate any of the valves operated by keys in rows 22 and 24 but will operate different valves, as will hereinafter more fully appear. To illustrate how I have arranged that the same valve may be operated by either of the keys E, e. g., I have illustrated one of the keys 25 in Fig. 5 having an elongated bar 30 provided with a recess 31 for a spring 32 adapted to maintain the key 25 in elevated condition, as will be readily understood by those skilled in the art. Attached to the elongated bar 30 is a valve lifting rod 33 adapted to engage in an eyelet 34 in a valve 35 that seats on four of the port holes 15 in valve seat plate 14 and over certain of the openings in the top of reed holders 19 and 20.

In Fig. 5 I have shown one of the keys 27 which is similar to key 25 and is provided with an elongated bar 36 which however is not as long as the elongated bar 30 because the key 27 is one of the innermost keys and does not require as long a bar, and for another reason also, as will hereinafter appear. The elongated bar 36 is connected to a valve lifting rod lifter 37 adapted to engage in an eyelet 38 and valve lifting rod 33. One of the keys 27 is shown in Fig. 3 in relation to the key 25. This key 27 needs no spring as will also be evident hereinafter. It will be seen that by striking the key 25 the key 27 will be influenced on account of the arrangement between the eyelet 38 and the valve lifting rod lifter 37, and it will also be seen that if key 27 is struck, key 25 will be influenced for the same reason.

In Figs. 7 and 8, I have shown one of the keys 26 of the center row of keys. These keys are like the others except that each key 26 has a stop 26' which abuts ribs hereinafter described in a lowered position of the key to limit the

lower limit of travel of the key. Attached to the key 26 is an elongated bar 39, which fits between said ribs to be hereinafter described, and this elongated bar 39 is not as long as the bar 30 because the keys 26 are in the middle row and are not as far removed as the keys 25 from the valves, and also because the keys of the middle row actuate the inner set of valves for the nearer pair of reed holders 17 and 18. Each key 26 is provided with a recess 40 for spring 21 to maintain each key 25 in elevated position. Connected to the elongated bar 39 is a valve lifting member 42 engaging in an eyelet 43 in a valve 44 seating on some of the port holes 15 in the valve seat plate 14 over the reed holders 17 and 18.

The keys and elongated bars are mounted by means of apertures in the bars and pivot locking bars inserted in said apertures, and ribs are provided to properly position and guide the movement of the bars and parts. A plurality of apertured ribs 45 is integrally formed in the frame 11. The elongated bars 30 and 39 fit alternately between these ribs which extend the length of the elongated bars but not under the keys. The elongated bars 30 and 39 are provided with apertures 46 for the receipt of a pivot locking bar to permit independent pivoting of the keys and bars with respect to each other. The pivot bar 47 which is inserted from one end of the frame and passes through the apertures of all the bars 30 and 39 as aforesaid to line up all said bars and position them, is shown in Figs. 1 and 2. In addition to providing ribs and a pivot bar for lining up and positioning the bars 30 and 39, means also are provided for lining up and positioning the elongated bars 36 of the innermost row of keys. To that end a supplementary frame 48 rests on rib members 45 and is provided with a plurality of apertured ribs 49. The elongated bars 36 are adapted to fit in between alternate paths of ribs 49 in a well-known manner, and the elongated bars 36 are provided with apertures 50, into which a pivot rod 51 is adapted to be inserted from one end of the frame, as shown in Figs. 1 and 2. The lower ends of ribs 49 and the elongated bars are concealed by a closing plate 52, and the valve structure is concealed by the usual hood member 53. The valves 35 and 44 may also be provided with the usual return springs 54, one end of each spring being mounted in a bearing on the valve seat plate 44, and the other end in the valve, and the springs may be alternately arranged as shown, for convenience, as is well known.

Alternate reed holders 17 and 19 are each shown provided with a sliding plate which may be mounted in the reed holder structure to close one half of the port holes 15 or in other words one long row of port holes, if desired. Each sliding plate has a single row of port holes 56 adapted to register with one long row of port holes 15 in the reed holder and may be connected with an operating bar 57 shown in dotted lines in Fig. 1, which may be connected to any external operating means for causing the sliding plates to open and close some of the port holes 15.

It will be seen from the foregoing that the keys 25 and 27 work in unison with the valve 35; that is, e. g., referring to the end keys E of keys 25 and 27, either of these keys will operate the same valve 35 and produce the same note because the key 25E will directly operate the valve 35 and because key 27E will operate the valve lifting rod 33 of key 25 to operate valve 35,

and inasmuch as the two reed holders 19 and 20 are the same in the preferred arrangement which I have shown, the valve 35 upon each operation, whether by key 25 or key 27, will uncover the same port holes to give the same note. The keys 26 will, of course, always operate the valve 44 which is coordinated with the reed holders 17 and 18. By means of the sliding plates 55, if it is desired, one long row of the port holes in each of the reed holders 17 and 19 may be cut out, and also if desired, the reeds of the cells with which the plates 55 are coordinated, may be made heavier than all the other reeds so as to provide notes an octave lower when the sliding plates are in open position. Thus, for example, if the valve 35 is operated and the sliding plate is in closed position, three port holes or valves will be operated to give, for example, three C notes, or a triple volume of C at the same time. However, if the plates are in open position, in addition to obtaining three C notes, at the same time a fourth C note will be obtained one octave lower if the reeds are of the proper construction, or this may be varied as desired, as will be manifest.

Heretofore, for example, where three rows of keys with each key having a different note were used, it has been necessary to change the position of the fingers to transpose if one desired to transpose from one key to another when playing any definite scale. By means of my arrangement, when playing any scale in its original key, one may transpose into another key without the need of changing the fingers. For instance, referring to Fig. 1, when playing the C chord, press the thumb on C first row, the second finger on E first row, the third finger on G second row, and the fifth finger on high C first row. When playing the same chord on C#, (half tone higher), press the thumb on C# second row, second finger on E# (or F) second row, third finger on G# third row, and the fifth finger on high C# second row. When wishing to play in the key of D, press D near C first row with the thumb, placing the other fingers in the same position as when playing the preceding chords. For other chords, follow the same directions. The invention is very useful when accompanying singers, for orchestra and when playing with instruments in different keys. In addition, by means of my arrangement,

one can play pieces having higher or lower notes without the need of arranging them.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, a valve, a key provided with a valve operating member and an eyelet on said member, a second key having an eyelet engaging element whereby said second key is adapted to operate said first key to produce the same note.

2. In a device of the character described a plurality of rows of independently actuated keys, there being duplicating rows, note sounding means, actuating means to sound said notes, means actuated by the keys of one or more of said rows to operate said note sounding actuating means, and means actuated by the keys of said duplicating rows to operate the note sounding actuating means of the duplicated rows, one of said actuating means having an eyelet for engagement with the other of said actuating means.

3. In a device of the character described a plurality of independently actuated keys, there being duplicating rows, note sounding means, actuating means to sound said notes, a rod secured to each of the keys of one or more of said rows and engaging to actuate said note sounding actuating means, and a rod secured to each of the keys of the duplicating rows and secured to the corresponding rod of keys of the said duplicated rows.

4. In a device of the character described, a valve, a key provided with a valve operating member and an eyelet on said member, a second key, and a rod secured at one end to said second key and at the other end to said eyelet, whereby said second key is adapted to operate said valve to produce the same note.

ANTONIO ZORDAN. 50