



- Copyright
- Designs
- Trade Marks

Patents

Contact Details

Search

Site Map

Index

[Home](#) : [Patents](#) : [Database](#) : [Status](#)

PATENTS STATUS INFORMATION FULL DETAILS

Please click on button below to view the published patent application via esp@cenet.

ESP@CENET

REGISTER ENTRY FOR GB2131592

Form 1 Application No GB8234412.8 filing date 02.12.1982

Title AN ARRANGEMENT OF MUSICAL NOTES FOR MUSICAL INSTRUMENTS

Applicant/Proprietor

BRIAN GORDON HAYDEN, Park House, 17 High Street, Templecombe, Somerset,
United Kingdom [ADP No. 01107820001]

Inventor

BRIAN GORDON HAYDEN, Park House, 17 High Street, Templecombe, Somerset,
United Kingdom [ADP No. 01107820001]

Classified to

G5J
G10B G10D G10H

Address for Service

BRIAN GORDON HAYDEN, Park House, 17 High Street, Templecombe, Somerset,
United Kingdom [ADP No. 01107820001]

Publication No GB2131592 dated 20.06.1984

Examination requested 16.11.1984

Patent Granted with effect from 20.08.1986 (Section 25(1)) with title AN
ARRANGEMENT OF MUSICAL NOTES FOR MUSICAL INSTRUMENTS

28.06.1991 Patent ceased on 02.12.1990

**** END OF REGISTER ENTRY ****

RENEWALS DATA

Date Filed	02.12.1982
Date Not in Force	02.12.1990
Date of Last Renewal	29.11.1989
Year of Last Renewal	8
Date Next Renewal Due	02.12.1990

(12) UK Patent Application (19) GB (11) 2 131 592 A

- (21) Application No **8234412**
(22) Date of filing
2 Dec 1982
(43) Application published
20 Jun 1984
(51) INT CL³ **G10B 3/12**
G10D 1/00 11/00
G10H 1/34
(52) Domestic classification
G5J 16 22 2B5 EGD
ESA N6B N6E N6X5 NX
SD WAK
(56) Documents cited
None
(58) Field of search
G5J
(71) Applicant
Brian Gordon Hayden
Park House
17 High Street
Templecombe
Somerset
(72) Inventor
Brian Gordon Hayden
(74) Agent and/or Address for
Service

Brian Gordon Hayden
Park House
17 High Street
Templecombe
Somerset

(54) **Arrangements of notes on musical instruments**

(57) Various arrangements of touches on Musical Keyboards previously evolved are detailed, and touches on some conventional multi-stringed and multi-tonebar musical instruments mentioned.

The present invention places notes on musical instruments along several adjacent paths; so that along the paths, notes at intervals of whole tones are close together, and between the paths, notes at intervals of fourths and fifths are close together; but a few high and low notes may be arranged at other

places, to give a complete chromatic compass of notes in a compact space.

Keyboards for Organs, Accordions, and in particular Concertinas are described in greater detail. Several different forms of multi-stringed musical instruments are described; and a few details of other musical instruments that may use the invention are given.



ERRATA

SPECIFICATION NO 2131592A

Front page, Heading (57) Abstract line 4 *delete* touches on

Attention is also directed to the following printers errors:

Page 2, line 4, *for* disadvantage *read* disadvantages

Page 2, line 86, *for* consequently *read* consecutively

Page 5, line 86, *for* turning *read* tuning

Page 5, line 98, *for* paet *read* part

THE PATENT OFFICE
7 February 1985

Bas 260689/5

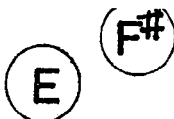


FIG. 1 I.

GB 2 131 592 A

(12) UK Patent Application (19) GB (11) 2 131 592 A

- (21) Application No 8234412
- (22) Date of filing
2 Dec 1982
- (43) Application published
20 Jun 1984
- (51) INT CL³ G10B 3/12
G10D 1/00 11/00
G10H 1/34
- (52) Domestic classification
G5J 16 22 2B5 EGD
ESA N6B N6E N6X5 NX
SD WAK
- (56) Documents cited
None
- (58) Field of search
G5J
- (71) Applicant
Brian Gordon Hayden
Park House
17 High Street
Templecombe
Somerset
- (72) Inventor
Brian Gordon Hayden
- (74) Agent and/or Address for
Service

Brian Gordon Hayden
Park House
17 High Street
Templecombe
Somerset

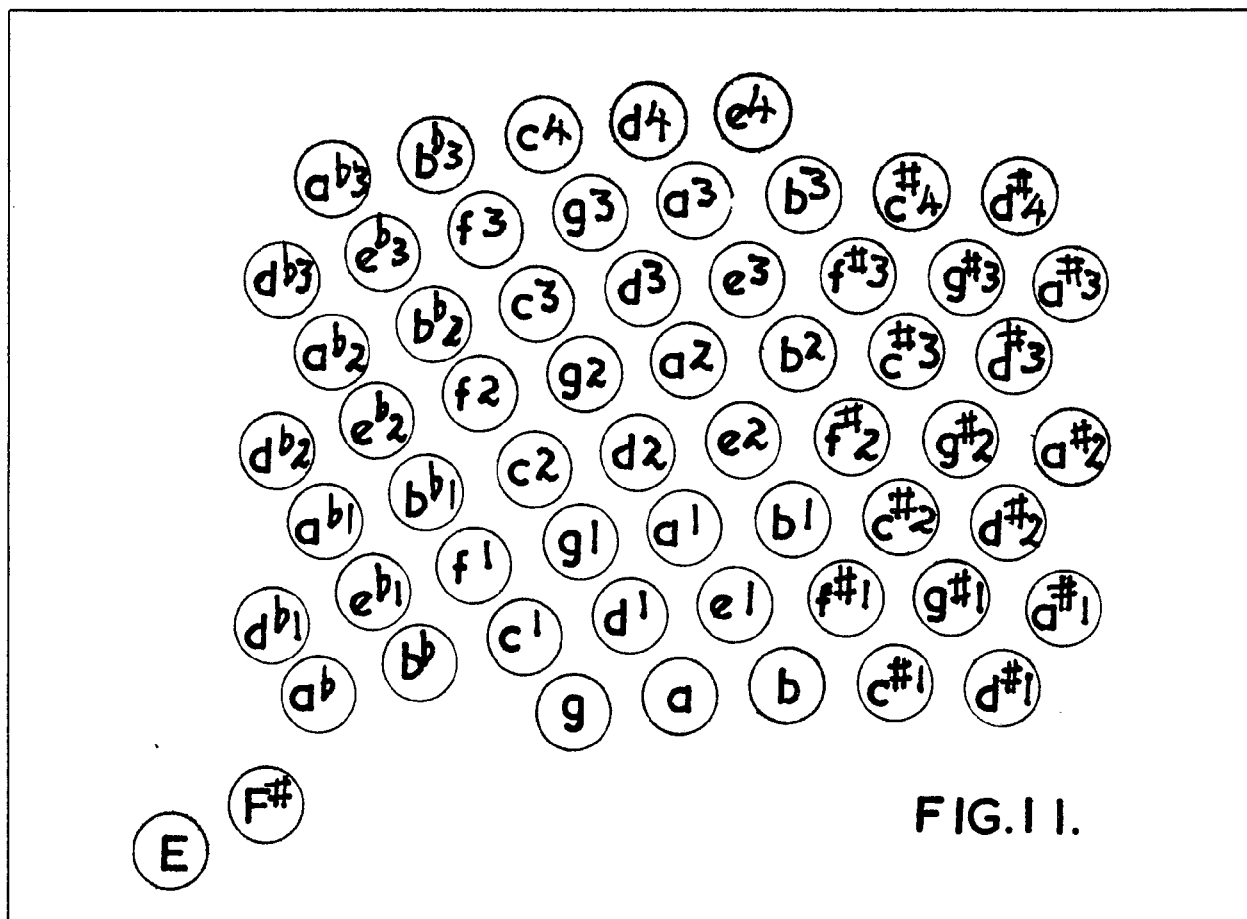
(54) Arrangements of notes on musical instruments

(57) Various arrangements of touches on Musical Keyboards previously evolved are detailed, and touches on some conventional multi-stringed and multi-tonebar musical instruments mentioned.

The present invention places notes on musical instruments along several adjacent paths; so that along the paths, notes at intervals of whole tones are close together, and between the paths, notes at intervals of fourths and fifths are close together; but a few high and low notes may be arranged at other

places, to give a complete chromatic compass of notes in a compact space.

Keyboards for Organs, Accordions, and in particular Concertinas are described in greater detail. Several different forms of multi-stringed musical instruments are described; and a few details of other musical instruments that may use the invention are given.



GB 2 131 592 A

1/7

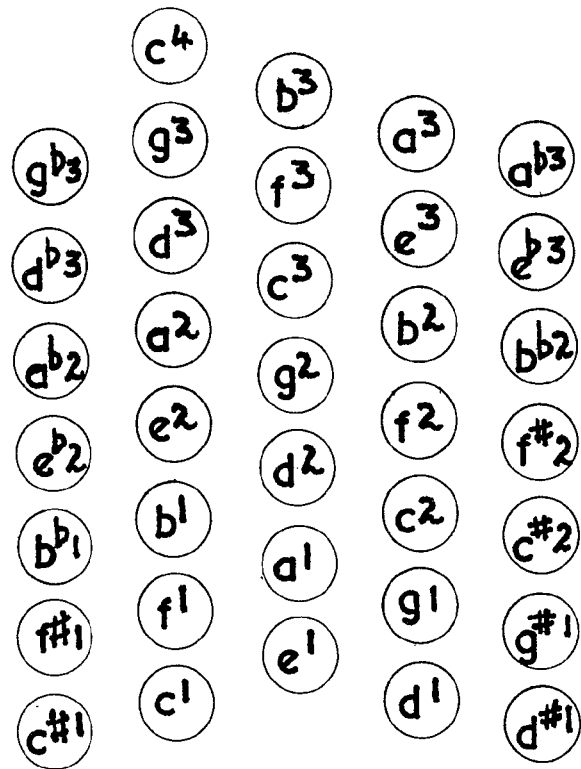


FIG. 2.

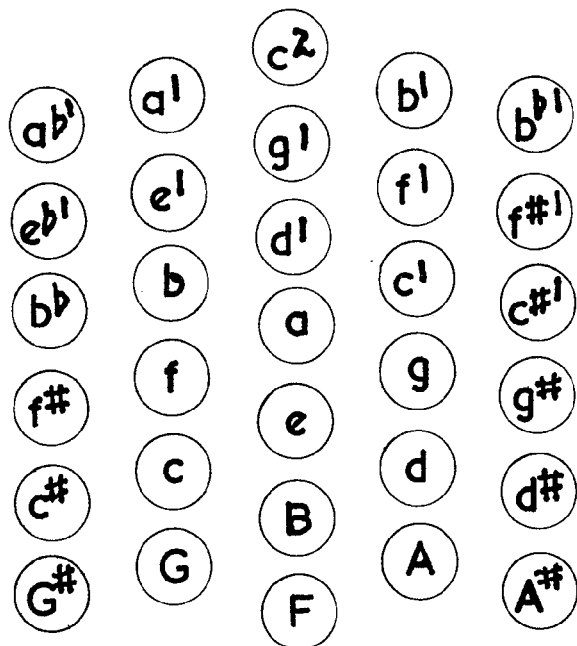


FIG. 1.

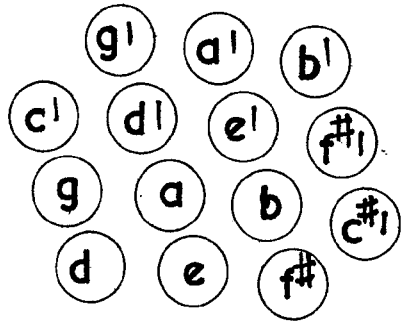


FIG. 6.

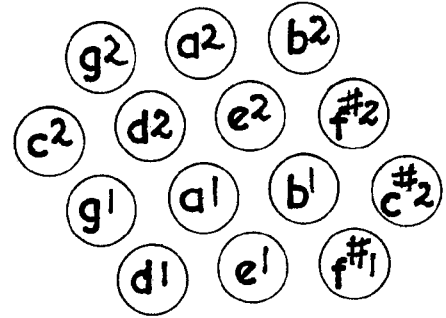


FIG. 7.

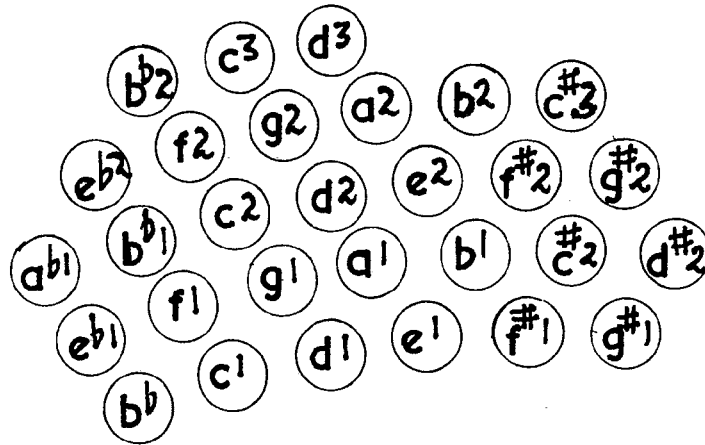


FIG. 9.

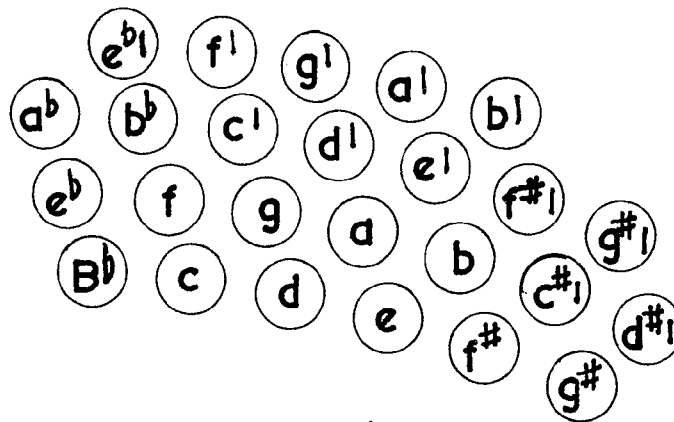


FIG. 8.

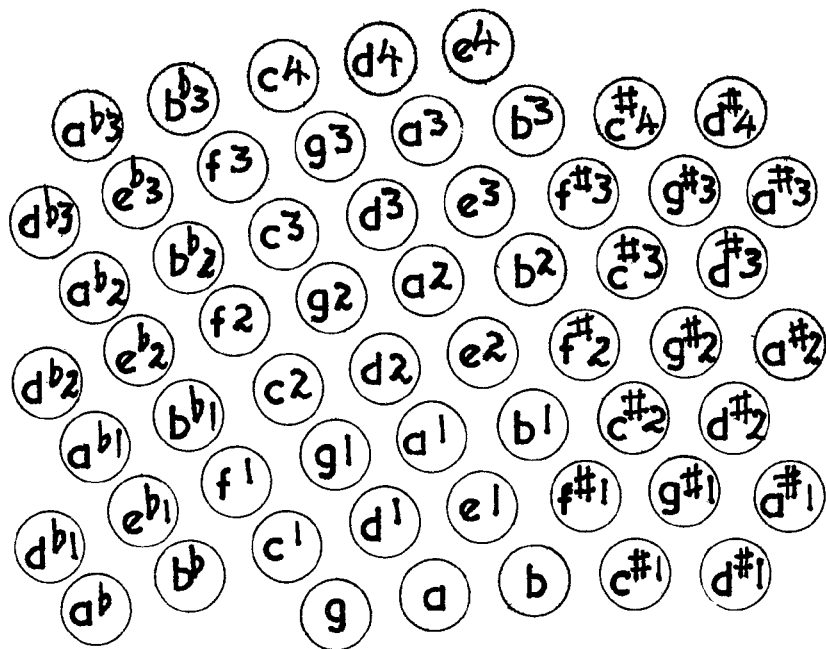


FIG. 11.

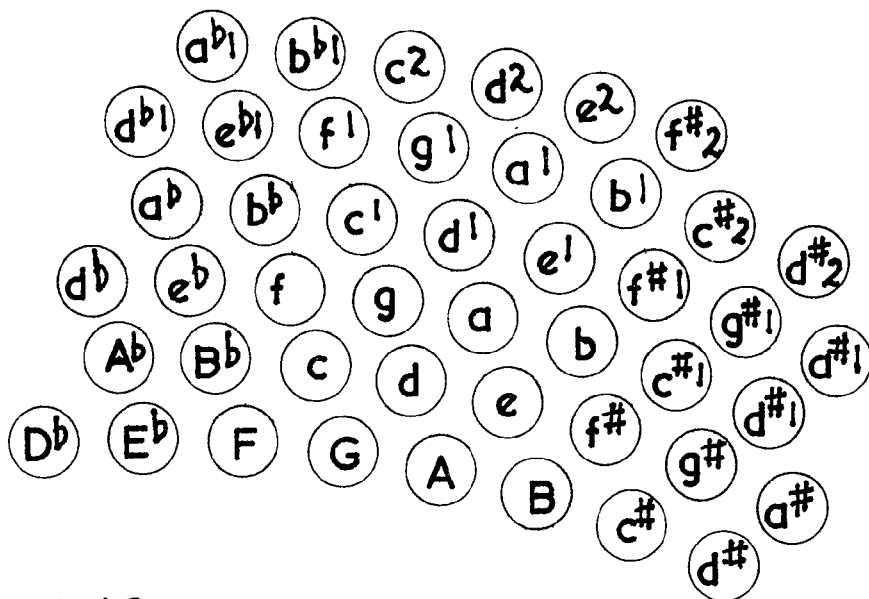
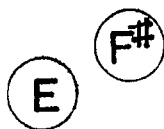
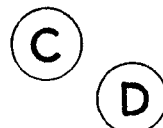


FIG. 10.



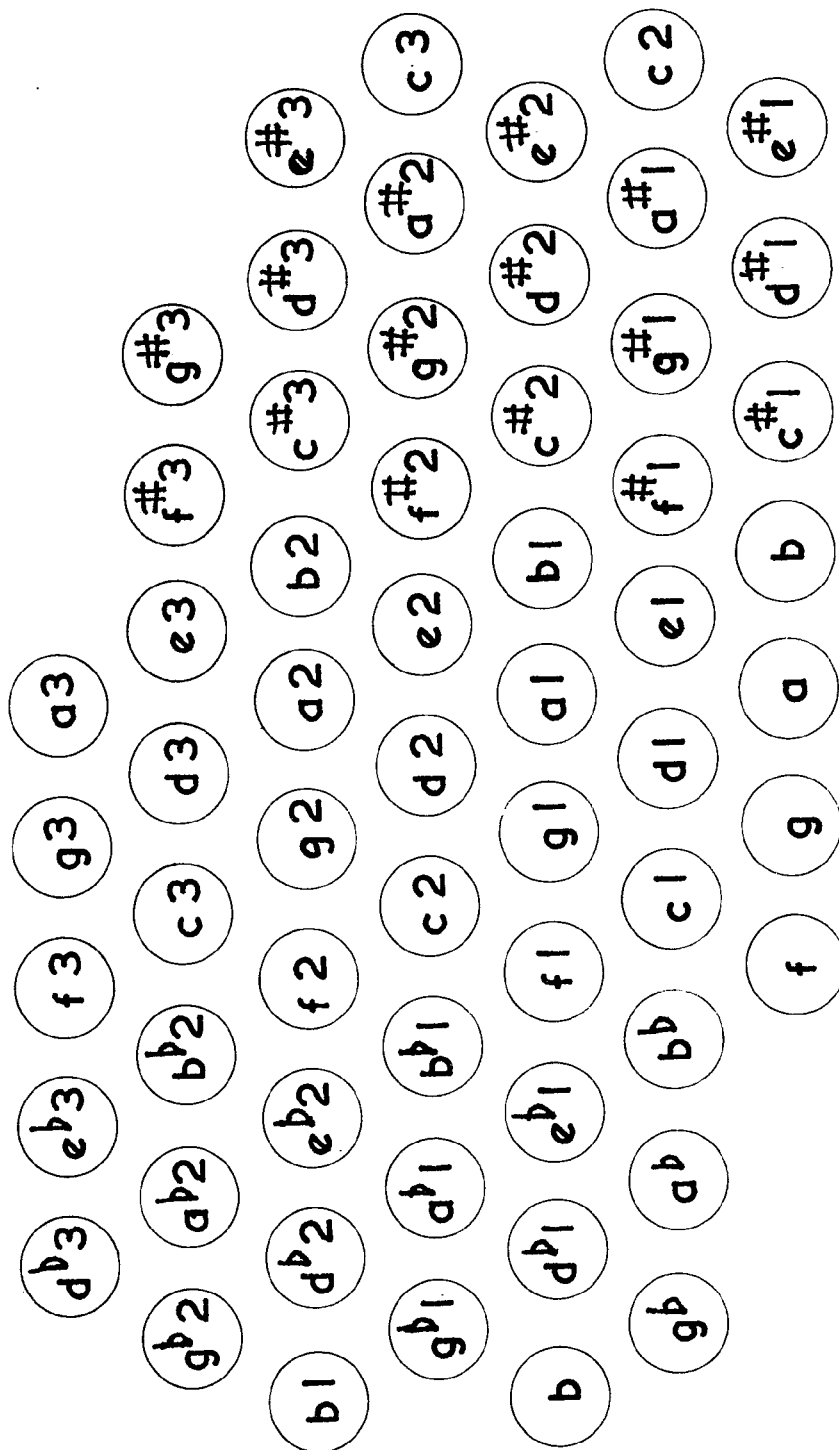


FIG. 12.



FIG.13.

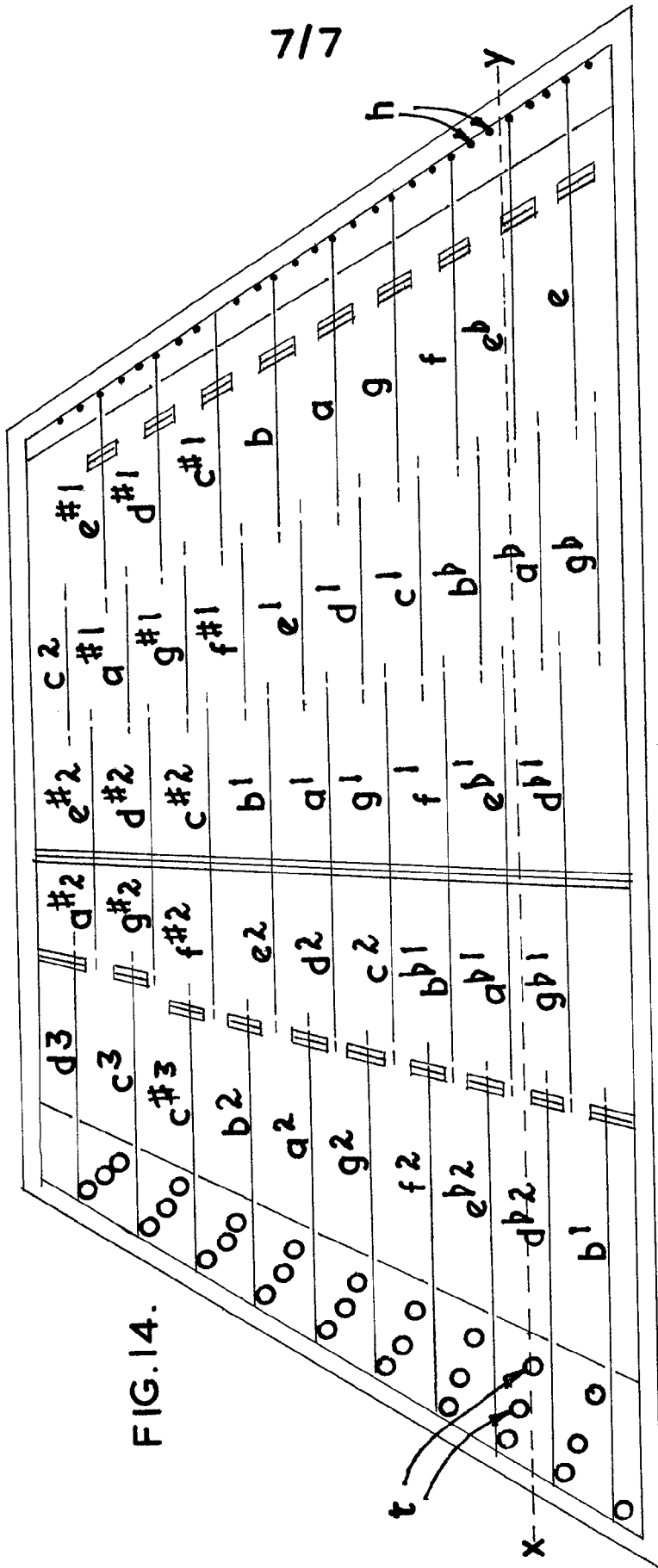


FIG. 14.

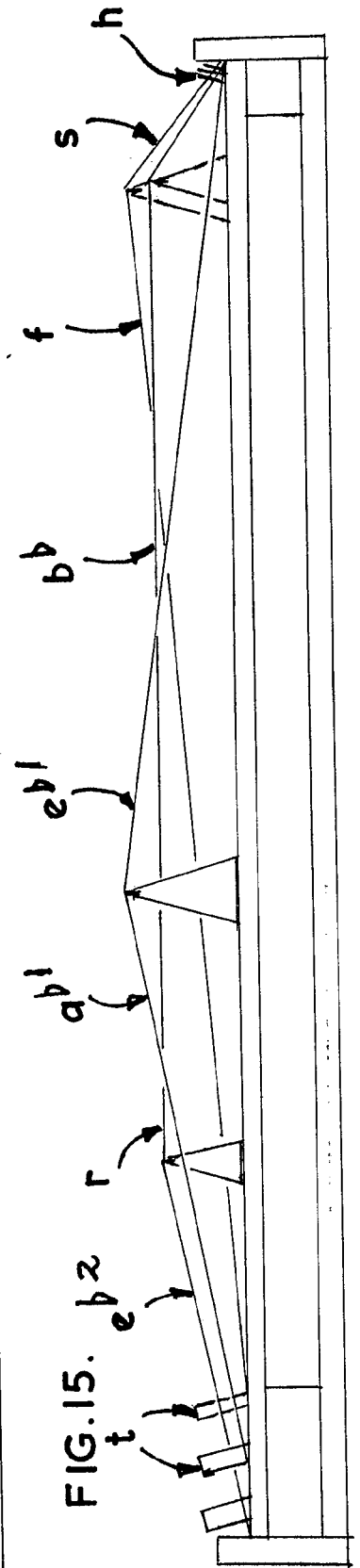


FIG. 15.

SPECIFICATION

An arrangement of musical notes for musical instruments

5

Field of the Invention

The present invention relates to Musical Instruments generally and in particular to Concertinas, Accordions, and Organs. The present invention also relates to Musical Instruments that use a Keyboard of any kind, and to the kind of Musical Instrument that has a multitude of tuneable tone producing objects with one or a small group of them for every, or practically every Note that can be played on that Instrument.

Background of the Invention

Many different Keyboards have been manufactured or suggested for Concertinas, Accordions, and other Keyboard Instruments. These fall into four broad classifications:- 1) Piano Type, 2) Neutral Chromatic Type, 3) Melodeon Type, 4) Chord Systems.

1) The Piano Type places the seven notes per octave of the diatonic scale of C major (the so called "naturals") in a prominent position, or positions. The other five notes of the chromatic octave (the so called "sharps" and "flats") are placed in a subordinate position, each near it's corresponding natural. These Keyboards include the conventional Pianoforte or Organ Keyboard, and it's narrower form used on the Piano-Accordian, Wheatstone 1829 Pat. No. 5803, more fully illustrated in Figs. 1 and 2 of his 1844 Patent, Wheatstone 1844 Pat. No. 10041; the keyboard illustrated in Fig. 9 of that Patent, Wheatstone 1861 Pat. No. 2289, Rust 1862 Pat. No. 1976, Maccann 1884 Pat. No. 4752, Lowenthal 1888 Pat. No. 13217, Sharp 1890 Pat. No. 12135, The Crane Triumph System illustrated in Figs. 1. and 2. of this application, Jeffries Duet Concertina System illustrated in Figs. 3. and 4. of this application, Hanks 1896 Pat. No. 9503, Mitchel 1912 Pat. No. 24523, 1925 Pat. No. 259703, 1930 Pat. No. 338094, (illustrated in Fig. 2 of that Patent), Pitt-Taylor 1917 Pat. No. 109423, and 1918 Pat. No. 136300, Stevens 1919 Pat. No. 153358, and Bertram 1923 Pat. No. 217653.

The arrangement of the standard (Pianoforte and Organ) keyboard notes, is also used on some non-keyboard instruments such as the Xylophone, Glockenspiel, Tubular Bells and Welsh Triple Harp.

The advantages of the Piano Type of Keyboard are that the diatonic key of C major is placed in a prominent separate place making these keyboards, to a greater or lesser extent, reasonably easy to begin to learn to play; and standard written musical notation (being invented and developed for the standard keyboard) is fairly easy to read with this type of

keyboard.

The disadvantage of these keyboards is that every diatonic key is played slightly differently, which increases the amount that has to be learned on these keyboards. Transposition of music between one diatonic key and another, requires a considerable amount of theoretical musical knowledge. The Standard Keyboard also has the disadvantage of a very large linear width, in relation to the size of the hands.

2) Neutral Chromatic Keyboards arrange the touches for the 12 different semitones of the chromatic octave, in runs of three to six consecutive semitones. These keyboards include Wheatstone 1844 Pat. No. 10041, the two keyboards illustrated in Figs. 7 and 8 of that Patent, Gromard 1863 Pat. No. 1401, Janko 1885 Pat. No. 536, Huish 1901 Pat. No. 20299, Pitt-Taylor 1916 Pat. No. 102552, 1922 Pat. No. 208274, and 1923 Pat. No. 220824, and the Continental Chromatic Accordion Keyboard illustrated in Fig. 5. of this application.

Some of these keyboards have the advantage that music learned in one diatonic key can be transposed into some or all the other diatonic keys without any theoretical musical knowledge whatsoever. Other have notes arranged so that many common chords can be played easily on several adjacent touches, however musically related chords are not necessarily close together. The disadvantages of these keyboards are that they are difficult to begin to learn to play, having complex fingering patterns, and are also difficult to learn to read music with. Only the Janko Keyboard has these disadvantages to a very slight extent, but on the other hand it has most of the large linear width difficulties associated with the Standard Keyboard.

A basic (two path) version of the Janko Keyboard is also used on some Hammer Dulcimers and on the Bass strings of the Orchestral Cymbalom.

3) Melodeon Type Keyboards have touches which play different notes on each touch (or on most touches) when the bellows are pressed in or pulled out. These include:- Melodeons, Anglo-German and Anglo-Chromatic Concertinas, Bandoneons, and British Chromatic Accordions. Those which have been patented include; Jewel 1861 Pat. No. 2152, Berry 1881 Pat. No. 3568, Jones 1884 Pat. No. 9314, Stratton 1887 Pat. No. 12734, Schonholz and Twiehoff 1908 Pat. No. 7568, Mitchel 1926 Pat. No. 260199, and 1930 Pat. No. 338094 the keyboard illustrated in Fig. 1 of that Patent. (Mitchel also used this idea on a few of the highest notes on some of his other patented keyboards mentioned previously).

These keyboards have the advantage that they are very easy to begin to learn to play, especially to persons with little or no theoretic-

cal musical knowledge. It is also possible on some of them to transpose music without difficulty, between a few diatonic keys. The disadvantage of these keyboards are that music reading is quite difficult as it may have to be learned from several different points of view, and music in diatonic keys not closely related to the "home keys" can be quite difficult to play. Some chords are very easily played, but others are very difficult or impossible to play at all.

It is not possible to apply these systems to Organs or other Keyboard Instruments; nor to non-keyboard instruments except Harmonicas or Mouth Organs.

4) Chord Systems provide either fixed Chords where each chord is activated by a single touch; such as the Standard Accordion Bass System (also used on some Electronic Organs), and Soblic 1893 Pat. No. 14959; or a series of touches so arranged that by activating several adjacent touches, various set Chords can be played; such as Dawkins 1879 Pat. No. 2847. The advantage of these systems is that simple accompaniments can be easily played without any great knowledge of Musical Theory. The disadvantages are that the Chord provided cannot be varied, and melodies cannot be played on fixed chord systems and are difficult to play on the type than has individual note touches.

Chord arrangements are also provided on non-keyboard instruments such as Zithers; and Autoharps which have a basic form of keyboard but are played by the hands across the strings.

5) Other Keyboard Systems that do not fall into any of the above broad classifications include:- Wheatstone 1844 Pat. No. 10041 the keyboard illustrated in Fig. 10 of that Patent, which places the notes of the diatonic key of E flat on the left hand side, and the notes of the diatonic key of E natural on the right hand side; the other diatonic keys being played between the two hands. Brown 1875 Pat. No. 3719 follows the basic pattern of the Piano Keyboard, but uses no less than 49 differently tuned tones to every octave. It's main purpose is to play music with perfectly tempered scales, rather than the equal tempered scales now universally used on keyboard instruments. Every diatonic major scale is played along a straight line at different distances from the front of the keyboard; with modifications for some minor scales. Pitt-Taylor 1924 Pat. No. 233833 has notes in the key of C major arranged in a similar manner to the Maccann 1884 keyboard but the "sharps" and "flats" except F sharp are arranged significantly away from their corresponding "naturals".

Summary of the Invention

It is the object of the present invention to place the Notes of Musical Keyboards in a

regular and compact form; to facilitate learning and playing the instruments they control and transposition of Music between one Key Signature and another.

70 The Notes within the body of the Keyboard are arranged at touches along several adjacent musical paths. At each touch a note can be played that is a musical whole tone higher or lower than the note which can be played at an adjacent touch on the same musical path. The musical paths form ascending or descending whole tone scales or sequences.

The several musical paths are arranged adjacently to each other so as to bring musical intervals of fifths and fourths close together. One or two Notes at both extremities may vary from this arrangement.

The arrangement has the advantage that in some or all the commonly used Diatonic Major Scales; the Tonic, Supertonic, and Mediant notes of the scale occur consequently on one musical path, and the Subdominant, Dominant, Submediant, and Leading-note notes occur consecutively on an adjacent musical path; in a position close to the former three notes. Harmonies and Chords at different pitches occur in simple repeating patterns. Many or all closely related chords are close together. A simple chord pattern may be easily modified with minimal movement to play other inversions and open chord versions of the same chord; or to change from a major to a relative minor or viceversa. Many pairs of notes in octaves can be easily played; by pairs of adjacent fingers on manual keyboards, or by the toe and heel of one foot on carefully set up pedal keyboards.

The present invention may also be applied to non-keyboard musical instruments of the type that have a multitude of tuneable tone producing objects, with one or a small group of them for each note; such as the Xylophone, Glockenspiel, Sets of Bells, Psaltery, and Cymbalom.

Brief Description of the Drawings

The Drawings are intended to be read as diagrams showing the relative positions of the various touches on Keyboard Instruments, or tone producing objects on the Non-keyboard Instruments. They are not intended to be exact pictures of how the Keyboards or Instruments may look. The touches etc. may vary in shape and in their proportions compared with the space inbetween them. The musical notes which touches etc. are intended to play are written on them for clarity; practical examples would not normally have these letters written on them.

On Organs and similar instruments where one touch can play notes in several different octaves, and harmonics; the notes indicated are those which would sound if the instrument was functioning and an 8' stop was drawn or turned on.

The Notation used for the tuning diagrams is as follows:- c1 indicates middle C, c2 indicates the note one octave above this. c3, c4, and c5 indicate notes 2, 3, and 4 octaves above middle C respectively. Lower case c with no suffix indicates the Tenor C an octave below middle C, and the capital C indicates the Bass C two octaves below middle C. The other lower case letters with the suffix 1 indicates the various semitones between c1 and c2; other letters with or without suffixes indicate the other corresponding notes.

No specific absolute pitch or temperament is indicated by the notation; although it is normally expected that any instruments manufactured would be tuned to the current International Concert Pitch and in Equal Temperament.

Figs. 1.-5. show the tunings of conventional keyboard musical instruments. Figs. 1. & 2. show the left and right hand keyboards of a Crane Triumph Duet Concertina. Figs. 3. & 4. show the left and right hand keyboards of a Jeffries Duet Concertina. Fig. 5. shows the treble keyboard of a 72 button Continental Chromatic Accordion. Figs. 6.-13 show tunings of keyboards for musical instruments using the present invention. Figs. 14 & 15 show diagrams of a non-keyboard stringed musical instrument with tunings using the present invention.

Detailed Description

A Touch Point on a Musical Instrument is defined as the place where a player communicates his will to the Musical Instrument.

A Touch Point on a Musical Keyboard using the present invention is the part of a key or pedal which is presented in such a way that the player can touch or press it. When it is touched or pressed; and the musical instrument that is connected to is functioning and in tune; this through a sequence of events (mechanical, electrical, pneumatic, or by any other means of communication) will cause an appropriate Musical Note to sound.

A Touch Point on a Non-keyboard Musical Instrument using the present invention is the part of the tone producing object which is presented in such a way that the player can set it into vibration. This may be done directly with any part of the body, or indirectly by an object that can be manipulated by a player; such as a pick, bow, hammer, or beater; to set the tone producing object into vibration.

Any parts of the key, pedal, or tone producing object which are inaccessible or less accessible are not considered to be part of the touch point. Any parts of a tone producing object which happen to appear incidentally in another part of the musical instrument in a secondary position are also not considered to be part of the touch point.

Touch Points may take many different forms some of which are described below. No

claim is made that any of these forms are new and no application is made to patent any of them.

A Musical Path is defined as being a series of consecutive Touch Points. Usually the Musical Paths are straight; but could also be curved (as for example shown in Figs. 6-11 for the Concertina), serpentine, or waved in any form that suits the particular instrument. Adjacent Musical Paths will normally be parallel or nearly so; but may especially on Non-keyboard Instruments, converge or diverge.

Adjacent Musical Paths will normally be quite distinct from each other. However on some instruments the adjacent Musical Paths may intermesh with each other; either slightly, or to such an extent that the extremities of the Touch Points on one Musical Path are adjacent to the corresponding opposite extremity of a Touch Point on the next path but one; and in order to proceed from one Touch Point on a Musical Path to the next Touch Point on the same Musical Path, it will then be necessary to go over parts of the Touch Points in the adjacent Musical Paths.

The Touch Points are arranged along Musical Paths in the present invention in such a way that notes sounded at consecutive Touch Points on the same Musical Path have a musical interval of a whole tone between them. (No claim is made that this in itself is new. This is used on the Janko 1885 Keyboard and on the Continental Chromatic Accordion Keyboard diagonally.)

The Musical Paths are arranged relatively to each other in the present invention in such a way that the Note sounded at one Touch Point on one Musical Path and the Note sounded at the Nearest Touch Point on an adjacent Musical Path are a Musical Interval of a Fourth or a Fifth apart; or if two Touch Points on the same Musical Path are equidistant from a Touch Point on an adjacent Musical Path; then one of these pairs across the paths will sound a Musical Fourth apart and the other pair across the paths will sound a Musical Fifth apart. These alternatives allow for some small displacement or irregularity of the Touch Points and Musical Paths from the Median Position (where the fourths and fifths are at equal distances) as may be necessary in the practical manufacture of the instruments; or to further improve the ease of playing of the instruments.

To eliminate any similarity with odd bits of other Keyboards or arrangements of notes on other Non-keyboard Instruments; the present invention will further be defined to have at least two adjacent Musical Paths which have at least four Touch Points on each of them. The musical intervals between the consecutive Touch Points on each Path and the musical intervals between Touch Points on one Path and Touch Points on the other Path being exactly as laid down in the above 2 para-

graphs. (lines 10–29).

The Janko 1885 Keyboard has intervals of whole tones between the adjacent touches along all the paths of notes but has intervals of semitones between the nearest Touch Points on adjacent Musical Paths. The Continental Chromatic Accordion Keyboard, which has runs of 5 touches with whole tone intervals between them when viewed diagonally, has intervals of semitones and minor thirds between the nearest Touch Points on adjacent diagonal Musical Paths. Gromard's 1863 Keyboard which follows the pattern of the guitar, has intervals of fourths between most of the Musical Paths, but the intervals along the paths like the frets of the guitar are semitones. The Pitt-Taylor Keyboards of 1916, 1922, and 1923 also have some fourths and fifths in proximity, but have semitones and diminished fifths on adjacent or near touches in sequences, when viewed at other angles. The Wheatstone 1829, 1844, and 1861 Keyboards have many intervals of fifths between adjacent touches, but only occasional pairs of touches with whole tone intervals between them on a few keyboards.

Jeffries Duet Concertina (Figs. 3 & 4) has a number of pairs of touches that are at whole tone, fourth, or fifth intervals, and a set of 3 (e,a,b) that fortuitously fall together giving all three intervals; but no continuous sequences of any of these intervals. The Maccann 1884, and the Pitt-Taylor 1917, 1918, and 1924 Keyboards all use frequent intervals of fourths or fifths between pairs of adjacent touches, and less frequent intervals of whole tones on adjacent pairs of touches. Several groups of 3 adjacent touches with intervals of fifths, fourths, and whole tones occur as on the Jeffries Duet Keyboard. On the Pitt-Taylor 1917, and 1918 keyboards groups of 5 touches (g, a, b, d, and e) occur in several octaves. However these runs of whole tones are preceded and succeeded by intervals of semitones.

The Crane Triumph Duet Concertina (Figs. 1 & 2) places most of the intervals of fourths between adjacent touches, and also has intervals of whole tones on many pairs of adjacent touches. Several sequences of 3 touches with whole tone intervals occur, see Fig. 1—g, a, b; c', d', e'; and f', g', a'; which recur an octave higher on the right hand keyboard shown in Fig. 2. At either end of these groups of three touches semitone intervals always occur between the adjacent touches.

The Standard Keyboard, and others that closely follow its pattern, have runs of four adjacent touches (f, g, a, b,) with whole tone intervals between them. These are never however in close proximity with other similar runs of four notes, which have intervals of fourths or fifths between the two runs.

The present invention avoids placing semitone intervals between adjacent touch points,

within the main portion of the keyboard, or playing surface of a non-keyboard instrument. Exceptions may be made in the placement of Notes at the extremities of the arrangement in order to make the keyboard or playing surface more compact, or more easily played. A few out of the highest and a few out of the lowest (i.e. not more than four of each) semitones of a keyboard or playing surface, may be placed in positions other than that defined above.

(Page 8 lines 10–29). These Notes are placed at the highest end of the highest Musical Path or at the lowest end of the lowest Musical Path, or at other convenient places on the instrument. This may bring a few intervals of semitones between adjacent touch points. It should be noted that these "exceptional" Notes are considered undesirable, but necessary if it is wished to place all the touch points to play a specific musical compass within a compact space.

Any of the instruments described or illustrated may be made with a greater or lesser number of touches or tone producing objects; these may also be set in a higher or lower register. Those shown correspond to usual ranges of notes on conventional Musical Instruments, or are considered to form a useful musical instrument of the type illustrated.

The Keyboards and Instruments shown in the drawings could be equally well made with the Touch Points in the Mirror Image of that illustrated. This does not affect the definition of the arrangement of the Touch Points in the text above. The way illustrated is however the preferred arrangement.

Keyboards suitable for Concertinas using the present invention are shown in Figs. 6–11. The Touch Points take the form of the tips of the small round "pegs" which are normally used as touches on all types of Concertina. These "pegs" are usually smaller in proportion to the space inbetween them than is shown in Figs. 6–11. The notes for the thumbs shown in Figs. 10 & 11 should more ideally be placed on levers, to lever across the plane of the keyboard, rather than pegs to be pressed down. The method of holding the Concertina whilst playing, restricts the lateral movement of the fingers. To facilitate playing, a slight curve may be put on the Musical Paths, set at a small angle to raised hand rests and straps.

Figs. 6 & 7 show keyboards for a small Concertina, which can be played in only two diatonic keys—D and G major. (Any other pair of related diatonic keys could have been chosen.) Nevertheless a wide range of common popular and traditional tunes can be played on it; together with appropriate accompaniments.

Figs. 8 & 9 show keyboards for a medium sized Concertina. Only two semitones are repeated on each keyboard, however it is still possible to transpose many traditional, popu-

lar, and other tunes; together with their musical accompaniments; between eight different key signatures, without altering the fingering of the tunes. The other four key signatures

5 can be played on this Concertina, but an altered fingering will be needed. The instrument is not fully chromatic at the top and bottom of the keyboard shown in Fig. 8 and at the bottom of the keyboard shown in Fig. 10
9. A system using "exceptional" notes, which replaces the B \flat s at the bottom of each keyboard with the appropriate C \sharp s, and the B at the top of the bass keyboard with a B \flat is equally included in the definition of the present invention; but restricts the ease of transposition of music between certain key signatures.

The keyboards for a very large size of Concertina are shown in Figs. 10 & 11. (10. for the left hand and 11. for the right hand). It has a full chromatic compass of over five octaves, and a fuller complement of repeated sharps and flats, than the previously described Concertina. Some of the very lowest notes (C, D, E and F \sharp) are arranged to be played by the Thumbs.

Fig. 12. shows an arrangement of notes suitable for the treble keyboard of an Accordion, using the present invention as an alternative to the standard conventional 41 note Piano-Accordion. The Touches appear as round "buttons", of the kind normally used on all types of Button Accordion. Several of the notes appear on one side of the Keyboard as "sharps", and on the other side of the Keyboard as "flats"; these can be linked together to play the same sets of reeds, by mechanisms similar to those used for the Bass Action of conventional Accordions.

40 The Keyboard shown can be used in conjunction with a conventional 120 button Accordion Bass Keyboard. Alternatively a "Free Bass" keyboard using the present invention (in a lower register than the treble keyboard) may be provided. It should not be necessary to provide both systems on the same instrument, as chords of the type produced by the conventional accordion bass buttons, are very easily learned and played on Bass Keyboards which use the present invention.

A keyboard suitable for use on the Organ, using the present invention is shown in Fig. 13. The total range of notes shown is the same as a conventional 61 note Organ Keyboard. The touches shown could equally well be another shape; such as square rectangular, or hexagonal; the "sharps" and "flats" could be black and the "naturals" white. The Touches shown will normally operate electrical switches of the kind that are "on" when they are touched or pressed, in order to play Electronic Organs or Synthesizers of any kind; or Pipe Organs of the "Direct Electric" or Electropneumatic type. All these Organs can be conventional in every other way. It will be

seen that many of the notes appear in more than one place on the Keyboard. For electrical keyboards 2 or 3 switches can be made to operate the same circuit.

70 The keyboard illustrated in Fig. 13 shows an example of two "exceptional" notes:- the D and C in the lower left hand corner. The Keyboard is intended for use by both hands. The centre section of "sharps" and "flats" being used as "sharps" by the left hand and "flats" by the right hand. The keyboard may also be used in any convenient way a player wishes.

Fig. 14 shows an arrangement of notes for an open stringed musical instrument using the present invention. Fig. 15 shows a side view of a section of the instrument along the line x-y. Strings are fixed at one end of the instrument at hitch pins marked "h", and run over three different arrangements of bridges to turning pins marked "t" at the other end, giving five different Musical Paths of notes. A lesser number of paths may be used over part or all the instrument. The note that each string or course of strings is intended to play is written above the representation of each string. For clarity only those parts of the string which are available to the chosen means of excitation are shown in Fig. 14. It is these parts of the string that are the Touch Points for this type of instrument. Parts of the strings which are inaccessible to this means of excitation are not counted as part of the Touch Point; neither are any small parts of a string which quite incidentally happen to appear at the other end of the string. (A deliberately exaggerated example of this is shown marked "r" in Fig. 15.) The parts of the string between a bridge and it's hitch pin marked "s" are not counted part of the system either.

By varying the materials, lengths, and tensions of the strings, numbers of strings per course, and method of excitation of the strings, the instruments may be made to sound with different timbres. Strings may be made of metal such as steel, brass, or bronze; or non-metal such as Nylon, or gut. Various lengths, and consequently tensions, of the strings may be used for the same note. The strings may be single as shown in the diagrams, or be in courses of two or more strings close together. The strings in these courses may be tuned in unison, or one or more may be tuned in another register. The strings may be plucked by the fingers, or finger-picks, or by plectrums, as on the Psaltery, or Lyre; struck by hammers or beaters, as on the Hammered Dulcimer, or Cymbalom; played by a bow, as on the Rote, or Bowed Psaltery; or excited into vibration by any other suitable means.

The Instruments may be made with a sound board and sound box; to produce sounds of a purely acoustic nature; or they may be constructed on a solid base, and provided with

electrical pick-ups similar to those used on an electric guitar, and the sounds electronically amplified; such sounds may also be electronically modified.

5 The instrument illustrated shows notes to be played on both sides of the same bridge, with an interval of a fourth between them. (e.g. the a flat 1 which is a fourth above the e flat 1.) The instruments could equally well be made
10 with the notes on either side of this bridge an interval of a fifth apart. (e.g. a b flat 1 on one side with the e flat 1 on the lower part of the same string, the other side.) Either system is included in the general definition of the invention. (n.b. the e flat 2 would still normally be the string that was closest to both the a flat 1 and b flat 1 etc.) The instrument illustrated shows three examples of "exceptional" notes:- the e, c3, and d3.
20 Tone Bars of the Glockenspiel or Xylophone variety can be arranged in a similar manner to the strings of the stringed instrument illustrated, using the present invention. The Tone Bars are placed along Musical Paths, to form
25 whole tone scales. Several such Paths are arranged adjacently to each other, so as to bring musical intervals of fifths and/or fourths in proximity. All the tone bars may be placed on the same level; the Touch Points are then counted as the upper surfaces of the tone bars. Alternatively each Path may form a "step": with parts of the tone bars on one path overlapping parts of the tone bars on the adjacent Path; the Touch Points are then just
35 the exposed parts of the surfaces of the tone bars.

Similar arrangements can be used for the Tone Bars of Marimbas and Vibraphones. The stepped form with the tubes hanging in a vertical position, is suitable for sets of Tubular Bells.
40

Other tuneable Idiophones and Membranophones can be constructed to follow similar forms, using the present invention.
45

CLAIMS

1. A method of arranging: the places that the musical notes are played on musical instruments—hereinafter called "touchpoints";
50 which places a plurality of touch-points along several adjacent: series of consecutive touch-points—hereinafter called "musical-paths"; so that the musical interval between the notes that can be played at consecutive touch-points
55 along the same musical-path is a whole tone i.e. two semitones; and that the musical interval between the notes that can be played at a touch-point on one musical-path and the nearest touch-point on an adjacent musical-path, is either a fourth i.e. five semi-tones, or a fifth i.e. seven semitones, however if two consecutive touch-points on a musical-path are equidistant from a touch-point on an adjacent musical-path, then the musical intervals
60 across the musical-paths are in one case a

fourth and the other a fifth; and has at least two adjacent musical-paths with at least four touch-points on each, arranged with these musical intervals; but a few out of the highest
70 and/or lowest notes, may be placed at touch-points that do not correspond to these intervals.

2. An arrangement of touch-points as claimed in Claim 1., having four or more
75 musical-paths, and where each touch-point is the main accessible part of a tensioned tuned musical string, or course of several such strings close together.

3. An arrangement of touch-points as claimed in Claim 1., where each touch-point is an accessible part of a tuned tone producing object of some kind.

4. An arrangement of touch-points as claimed in Claim 1., that has 60 touch-points
85 in seven musical-paths, with 10 touch-points on most of them; to play all the notes of a chromatic compass of 41 notes; where the touch-points are the accessible surfaces of keys or buttons of any type that may be used
90 on an Accordion; so as to form an accordion keyboard which can be played by one hand, and used in conjunction with a keyboard of any type, or none, for the other hand.

5. An Accordion keyboard as claimed in
95 Claim 4., having a greater or lesser number of keys or buttons to play the same or another chromatic compass of notes.

6. An arrangement of touch-points as claimed in Claim 1., with four or more musical-paths, and 12 or more touch-points on the inner musical-paths; where each touch-point is a accessible surface of a keyboard touch of any kind, so as to form a musical keyboard, which may be played by the digits of both
100 105 hands.

7. A keyboard as claimed in Claim 6., that has seven musical-paths, with 13 to 17 touches on each musical-path, which can be used to play all the notes of five complete
110 chromatic octaves; where most of these notes can be played at, at least two different places on the keyboard, and a few can be played at three different places on the keyboard.

8. An arrangement of touch-points as
115 claimed in Claim 1., where the touch-points are the upper surfaces of pedals which can be played by the feet.

9. An arrangement of touch-points as claimed in Claim 1., with less than 12 touch-
120 points on each musical-path, where each touch-point is an accessible surface of a keyboard touch of any kind, so as to form a musical keyboard that can be played by one hand; but excluding any small arrangement of
125 touches that forms the whole or part of an arrangement of touches that has been previously brought to the Public Notice in some manner.

10. Any combination of several keyboards
130 of any types claimed in Claims 6., 7., 8., and

9., used in conjunction with each other on the same musical instrument.

11. A combination of 2 keyboards as claimed in Claim 10., for use on a Concertina, with 108 touches on the whole instrument, and a full chromatic compass of 65 semi-tones; and with some of the lowest notes arranged to be played by the thumbs.

12. Keyboards as claimed in Claim 11., but having a lesser number of touches for a Concertina with a lesser range of notes, with or without touches for the thumbs.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd.—1984.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.