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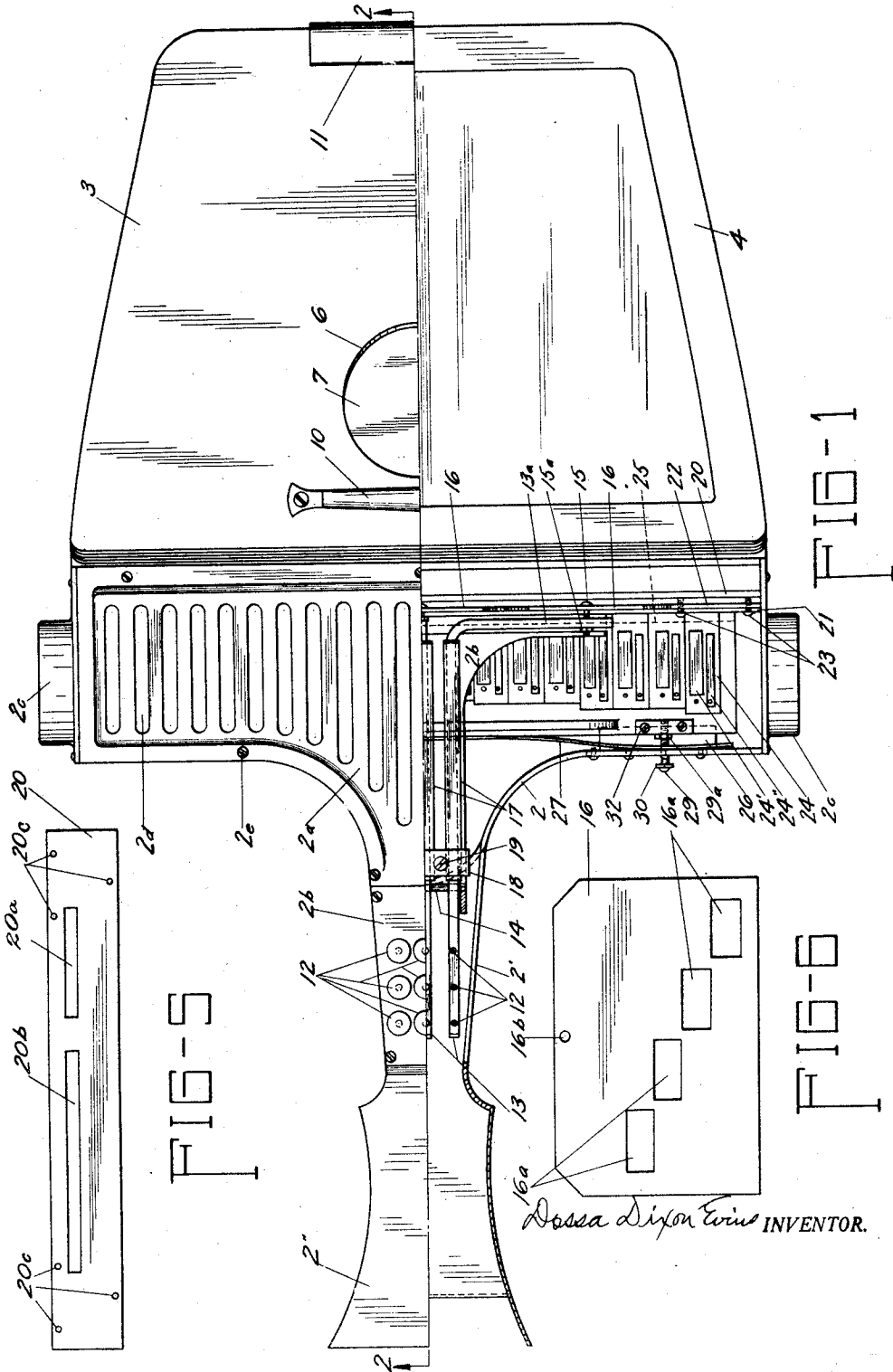
D. D. EVINS

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MUSICAL INSTRUMENT

Filed Feb. 15, 1930

3 Sheets-Sheet 1



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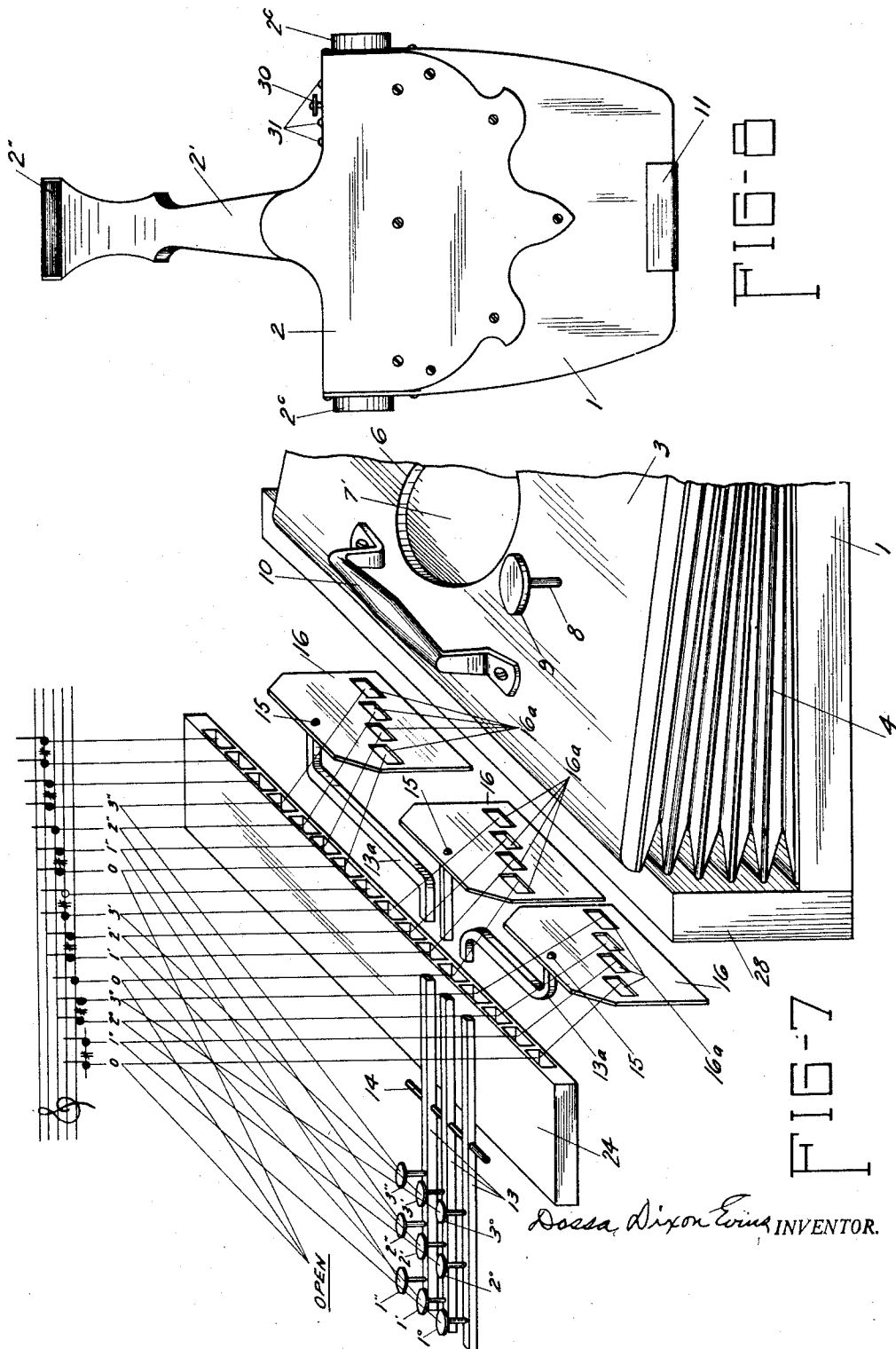
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3 Sheets-Sheet 3



Dessa Dixon Evins INVENTOR.

UNITED STATES PATENT OFFICE

DOSSA DIXON EVINS, OF DAVENPORT, IOWA

MUSICAL INSTRUMENT

Application filed February 15, 1930. Serial No. 428,739.

My invention relates to a musical instrument of the reed-bellows type and the objects of my invention are, among others:

1. To produce a novel type of musical instrument;
 2. To produce what might be described as a "reed-ukulele", being a reed-bellows instrument playable from the ukulele fingering as commonly printed on much of the popular sheet music at the present time;
 3. To produce a reed musical instrument with keys tuned to intervals corresponding to those of the ukulele;
 4. To produce a reed instrument operable by keys in which the pitch of the instrument may be readily changed by sliding the reed block;
 5. To produce a reed instrument which may be used in modern orchestras as a rhythm instrument, and for novel musical effects;
 6. To produce a reed instrument that may readily be played as a ukulele to accompany the voice;
 7. To produce a reed-bellows musical instrument that may be manufactured at moderate cost, may be changed to different keys instantly and will have a more desirable tone quality to accompany the voice than a ukulele, and one which will lend itself more readily to broadcasting and recording;
 8. To produce an instrument which, though fingered similarly to a ukulele and producing similar chords, is easier to learn to play;
 9. To produce a reed instrument with which a percussion effect may readily be produced;
 10. To produce a reed instrument capable of producing novel slurring effects.
- I attain these objects by the means illustrated in the accompanying drawings, in which,—

Figure 1 is a plan or front view showing the lower half of the figure with the front plates omitted;

Figure 2 is a vertical section on the line 2—2 of Figure 1;

Figure 3 is a view of the neck end of the instrument;

Figure 4 is an enlarged detail of the bellows valve and valve detent;

Figure 5 is a detail of the inner fixed plate; Figure 5a is a detail of the outer fixed plate;

Figure 6 is a detail of one of the slides;

Figure 7 is a diagrammatic sketch showing the pitch of the various reeds and corresponding keys;

Figure 8 is a reduced back view of my instrument.

Similar numerals refer to similar parts throughout the several views.

My instrument comprises a base plate, 2, which I prefer to form of aluminum or other suitable light, nontarnishable metal. The base plate, 2, has a neck, 2', and a hollow head, 2'' formed integral with it, the head acting to some extent as a horn. Suitably secured to the base plate, 2, is a backboard, 1, of a pair of bellows, with a frontboard or plate, 3, hinged to the backboard, 1, by a leather hinge, 11, or other suitable means.

The frontboard, 3, and the backboard, 1, of the bellows, are secured together by pleated bellows leather or other suitable air-tight material, 4, in the usual way.

The frontboard, 3, of the bellows, is provided with an opening, 6, for the admission of air and this opening is closable by a valve composed of a flat piece of wood, 7, having a leather facing, 7', glued or otherwise suitably secured thereto and an extension, 7'', of the leather facing is glued or otherwise suitably secured to the frontboard, 3, and forms a hinge for the valve.

A flat spring, 5, has one end secured to the board, 3, and the free end engages the valve board, 7, so as to hold the valve normally in closed position. A stem, 8, is united to the board, 7, and extends upwardly through an

aperture in the board, 3. The stem, 8, has a key, 9, upon the upper end thereof and when the key, 9, is pressed downward, it will hold the valve open. This valve arrangement with the detent, permits the operator to open the valve manually on either the up or down stroke and thus to cause an intermittent operation of the reeds when desired.

An air passage, 1a, is provided through the board, 1, and extends to an air trunk, 28a. This air trunk is a chamber formed in a block of wood, 28, secured in place at the upper end of the bellows. An inner fixed plate, 20, is secured adjacent the upper face of the block, 28, and has longitudinal openings, 20a and 20b, formed therein, extending the whole length of the wind trunk, 28a. The plate, 20, is secured to the block, 28, by screws, 20c, or other suitable means.

An outer fixed plate 21, corresponding in size to the inner fixed plate, is secured thereto by screws, 23, or other suitable means and is provided with a row of holes or ports corresponding in size to the ports, 16a, in the slides, 16, there being one hole in the outer fixed plate, 21, for each hole or port in the slides, 16.

A reed block or assembly, 24, having a plurality of reeds, 24'', secured on each side thereof, is slidably mounted upon suitable supports, 25 and 26, with its open edge adjacent the outer plate, 21, although a facing leather may be interposed between the reed block and outer plate, 21, if desired, to insure an air-tight connection.

The reed block is similar to the reed blocks of the better grade of harmonicas in common use comprising a plurality of chambers, each chamber having four reeds, two of which are of the same pitch and two of which are tuned to a pitch one octave above the other two, mounted in the reed block adjacent to corresponding openings in the side plates of the reed block. Two of the reeds for each such opening are mounted on the outside of the side plates and two on the inside of the side plates, so that whenever the valve leading to a given reed chamber and the bellows are operated in one direction, two of the reeds (tuned an octave apart) will sound and when the bellows are operated in the other direction, the other two reeds will sound. In order to avoid loss of air, I also mount a leather stop, 24', on the opposite side of the side plates opposite each reed.

This arrangement of reeds and leather stops is in common use and I make no claim to this precise form. Any other form of mounting for the reeds which will permit them to vibrate to a given current of air, may also be used without departing from my invention.

Between the inner and outer fixed plates, I mount slides, 16, which may be composed of fiber or other suitable material. Each of the

slides, 16, is provided with a plurality of apertures, or ports, 16a, the number of ports corresponding to the number of tones producible for each longitudinal series of keys upon the instrument, there being one open tone and three tones controlled by the keys for each series.

Ordinarily there will be four openings and four tones controlled by each slide, but if desired, a fourth key may be added to the middle series and a fifth opening added to the middle slide so that the middle series of keys will control five tones instead of four. The purposes of this arrangement will be explained hereafter in connection with Figure 7.

Each of the slides, 16, has an opening or port near the top thereof adapted to receive the lower end of one of the levers, 13, which may be secured to the slide by a screw, 15, or other suitable means.

Levers, 13, are pivoted in the neck of the instrument upon a pivot, 14, which is seated in extensions of the key plate, 2b. Keys, 12, have their stems slidably mounted in a key plate, 2b, and the inner ends of their stems bear against the upper ends of the levers, 13. As the keys, 12, are spaced at different distances from the pivot, 14, it is obvious that with the same amount of travel they will actuate the levers, 13, to different distances, and the spacing of the keys, 12, upon the levers, 13, and the spacing of the ports or openings, 16a, in the slides, 16, are so proportioned that when all of the keys are up, the slide, 16, will be at its lowermost point and the upper or lefthand opening, 16a, will aline with its corresponding reed chamber in the reed block, 24. When the upper or first key of each series is pressed, it will actuate the lever far enough to bring the second of the openings, 16a, into alinement with its corresponding opening in the reed block and when the second key is pressed, it will actuate the lever far enough to bring the third opening, 16a, into alinement with its corresponding reed chamber in the reed block and when the third or last key is pressed, it will raise the slide to its full height and bring the last or lowest opening, 16a, into alinement with its corresponding reed chamber in the reed block.

When a fourth key is added to the middle series, an additional opening will be provided in the corresponding slide lower than any of those shown although the slide may have to be enlarged for that purpose and the fourth key will bring such additional opening into alinement with its corresponding reed chamber in the reed block.

The neck of my instrument is hollow and the key plate, 2b, with the levers, 13, pivot, 14, and keys, 12, and the springs, 17, form an assembly which may be removed as a unit and is secured in place by screws extending through the key plate, 2b, and into the sides of the neck, 2', or by any other suitable means.

In order to normally hold the slides, 16, in their lowermost position, I provide springs, 17, one end of which is rigidly secured between crossbars or anchor plates, 18, secured to the key plate, 2b, by a bolt, 19, or other suitable means and the opposite end of which bears downwardly against the lower ends of the levers, 13.

The middle lever, 13, may extend in a straight line lengthwise of the instrument, but the side levers, 13, have angular extensions, 13a, formed integral therewith to extend them out to the proper position with reference to the slides, 16.

In order to allow the sound free exit from the reed block, I provide a grille plate, 2a, with a plurality of openings, 2d, formed therein. The grille plate, 2a, may be secured to the sound box by screws, 2e, or other suitable means and may be of any desired form.

A handle, 10, is attached to the front bellows board, 3, which may be readily grasped by the hand of the operator to operate the bellows. The back plate, 2, may be of any desired size or shape and may entirely cover the backboard, 1, of the bellows or may cover only a portion of it as shown in Figure 8.

In the upper portion of the sound box at one side of the neck, I provide a slot, 29b, through which projects a shifting arm, 29, the inner end of which is rigidly secured to an anchor block, 32, by lock nut, 29a, and the anchor block, 32, is secured to the reed block by screws or other suitable means.

A pointer, 30, is secured to the outer end of the arm, 29, and index screws or other suitable indicators are secured to the upper face of the sound box, 2, adjacent the slot, 29b, to indicate the various positions in which the reed block will register with the openings in the outer fixed plate.

A flat spring, 27, is seated within the sound box, 2, adjacent the upper edge of the reed block and bears against the reed block with sufficient pressure to hold the open edge thereof tightly against the fixed plate, 21, but the tension of the spring, 27, is adjusted so as to permit the reed block to slide upon its supports when a moderate pressure is applied to the shifting arm, 29.

When my instrument is provided with nine keys, there will be twelve reed chambers, at least three of which will register with openings in the slides at all times, and in order to tune the instrument to different pitches or keys, I provide the reed block, 3, with three additional reed chambers so that when the indicator, 30, points to the right index screw or character in Figure 3, the reed block will be in its lowermost position and the instrument will be tuned to the highest available tuning. As the reed block is pushed to the left so that the indicator, 30, points to the next index screw, the reed block will be moved to the left a distance equal to the length of one

of the openings, 16a, in the slides, 16, and the tuning of the instrument will be lowered a half step. Similarly, as the indicator is moved to the third and fourth index screws, the tuning of the instrument will be lowered additional half tones or steps.

In the drawings I have shown the reed block with the largest or lowest pitch reeds at the lower end of the figure, which would be at the right of Figure 3. It is of course possible to lengthen the reed block and provide additional reed chambers in it so as to allow still greater variation of tuning, but I have arranged the tuning of my instrument to correspond with the common tunings of a ukulele.

With the ordinary ukulele, four notes are sounded at a time, but the upper and lower notes of each chord are in many instances an octave apart so that providing each of my reed chambers with notes tuned an octave apart, I can produce the octave tones of the chord as well as the two intermediate tones which the ukulele produces.

Ukuleles are now commonly tuned to intervals of G, C, E and A, and I omit the G string and can produce the full chords ordinarily produced on the ukulele by my three rows of keys, each row corresponding to one of the other strings of the ukulele. When the first string of the ukulele is tuned to G, the second is tuned to C, the third to E and the fourth to A. The last three only are represented on my instrument. It is apparent that there are four half tones for the first row of keys. For convenience I call the tone produced when none of the keys are depressed, as the open tone. In this case, the open tone would be C, the first key of the first row, C#, the second key D and the third D#.

The next series would commence with open tone E, first key, F, second key, F# and third key, G. To correspond with the ukulele tuning, the next series would commence with the open tone, A, first key, A#, second key, B, and third key C.

Thus all of the half tones of the octave would be represented with the exception of G#. For use as an accompanying instrument, it would not be necessary to have G#, but when desired to produce an instrument for solo purposes, a fourth key may be added to the second row of keys and a fifth opening to the middle slide, which would allow the slide to register with G# on the reed block.

Of course the same explanation would apply to any other tuning to correspond with the ukulele tunings, as the intervals between the strings are commonly the same in the different tunings which, instead of being called different tunings, should more properly be described as tuning to different pitches.

In the operation of my instrument, the in-

strument may be held in the ordinary position of a ukulele or banjo, the handle of the bellows being grasped by the right hand and the left hand being used to finger the keys.

5 With the reed block shown, the action of the instrument will be constant, for as the bellows plate, 3, is driven in one direction, the air will be forced out through the air pas-
10 sage, 1a, air trunk, 28a, and the valve openings, 16a, which are in register with the reed chambers, and as the bellows plate, 3, is drawn upward, the air will be drawn in by suction through the reed block, 24, the regis-
15 tering openings, 16a, air trunk, 28a, and air passage, 1a, into the bellows.

The spring, 5, will normally be of sufficient strength to hold the bellows valve closed when the bellows board, 3, is moved in either direction, but the valve can be opened by the
20 key, 9, whenever desired.

By operating the bellows steadily, an organ effect can be produced on my instrument which will sustain the voice when used as an accompanying instrument, much better than
25 the strings of a mandolin, and when desired to use it as a rhythm instrument, the bellows may be operated intermittently by a series of quick pulls or pushes, and by accelerating the speed and intensity of such operations, an ef-
30 fect various similar to that of a percussion instrument can be obtained.

The tone characteristics of my instrument are such that it has great advantages for broadcasting and the tone quality is such that
35 it may be transmitted and received by radio broadcasting and receiving apparatus with very little impairment of quality and with very pleasing effects.

A novel slurring effect of the reeds can be produced on my instrument by holding the
40 third key clear down and letting it up one-third of the way at a time, so as to bring successive tones produced from a given slide; and a corresponding slurring effect in the
45 opposite direction can be made by starting with the open tone and then pressing down slowly the third key one-third of the way at a time to bring the successive notes.

I do not limit my instrument to tuning
50 similar to a ukulele, because it is obvious that the same sort of construction may be applicable to an instrument tuned to fifths such as the violin, mandolin, cello, banjo, etc., and in such cases the number of keys would be
55 increased so that each key would represent half a tone and sufficient keys be employed to produce all the half tones between one open tone and the next succeeding open tone.

Similarly, an instrument could be made to
60 represent some of the tunings of a guitar, but this would involve varying number of keys between the open tones and would not have all of the advantages that the present form of instrument has.

65 This form of instrument may be produced

in very cheap form for popular use or may be built of very fine materials and the highest workmanship for expert and professional use. So, also, the head, 2', may be in the form shown, in which case only a small portion of
70 the sound will pass out through the head or the neck and head may be varied so a larger portion of the sound will pass out through it and the head may be so constructed that the tone quality and characteristics will be varied
75 to a considerable extent.

In the operation of the bellows, when the valve is in its normal closed position, depressing the upper bellows plate pushes or drives the air through the air passages and
80 reed chambers with which the ports are in register, and when the upper plate of the bellows is retracted, it produces a suction which draws the air through the reed chambers in the opposite direction. When the
85 valve button is pressed down, the wood member of the valve is held away from the breather or valve opening, but the leather, if not fastened to the wood member, will permit air to be drawn into the bellows upon expansion,
90 but compression of the bellows will cause the leather to flap and close the breather opening, thus causing air to be forced through the reeds upon compression of the bellows only, and if the bellows are operated quickly, it
95 will produce an effect similar to percussion.

It is obvious that the reed chambers may be used with the reeds so mounted as to be actuated by suction alone or they may be so mounted as to be operated by pressure alone
100 and when thus arranged, will facilitate the use of the instrument as a rhythm instrument.

In the claims, for convenience, I refer to the entire assembly of reeds and their mounting as the "reed block" and I use the term
105 "valves" to designate the slides containing a plurality of ports, or any other suitable form of valve adapted to open and close the air passages to the reed chambers.

It will be observed from the diagrammatic sketch, Figure 7, that the uppermost or
11 lefthand port of the left valve plate, 16, shown in that drawing, is arranged to register with the opening in the reed block farthest to the left in that block and that the tone
115 produced by the reeds actuated through this port is middle C of the treble clef; also that the letter "O" is used at the end of the lead line to the note "C" to indicate the word
120 "open".

When the reed block is in the relative position shown in Figure 7, this tone can only be produced when the uppermost port in the valve plate, 16, registers with the port indicated in the reed block. As my valves and
125 levers are arranged, this port would so register only when no one of the keys 1°, 2°, and 3° is depressed by the finger of the player and the tone thus produced corresponds to the open tone of the third or C string of a
130

ukulele, as I have omitted anything to correspond to the open or fingered tones of the fourth, that is the lowest or G string, of a ukulele as now commonly tuned.

one port in register with its corresponding opening in the reed block.

No provision has been made in this instrument for the playing of solos in which only one tone at a time is sounded, although it is capable of a limited solo use in which each note of the solo is accompanied by two additional tones.

Similarly, the uppermost port, 16a, of the intermediate valve plate, 16, can register with its corresponding port in the reed block only when no one of the keys 1', 2', or 3' is depressed and the tone thus produced will correspond with the open tone of the second string of a ukulele. The same explanation applies to the uppermost port, 16a, of the third or right-hand valve plate, 16, shown in Figure 7, and its corresponding port in the reed block and the tone produced by the air passing through this port and its corresponding opening will correspond with the open tone of the first string of a ukulele.

In much of the popular music printed today, the fingering for a ukulele is printed above the staff containing the notes of a song and it is commonly represented by four vertical lines and four horizontal lines forming nine small squares. The open tones of the ukulele are indicated when these lines are left in the normal position and the fingering is indicated by printing a heavy black dot upon one of the vertical lines between the horizontal lines.

I use the term "open tone" in the same sense in which it is applied to a violin in which the so-called open tone is produced by drawing the bow across a given string which is not being touched or pressed upon by the finger of the player. The term is used in the same sense with reference to a guitar or ukulele when a given string is picked or twanged by the right hand of the player while not being touched or pressed upon by the finger of the left hand.

The fingering as thus printed in the conventional way for ukuleles can be played upon my instrument very readily by any ukulele player.

As the first, second and third open tones as shown in the diagrammatic sketch, Figure 7, correspond to the first, second and third open tones of a ukulele, it is obvious that to actuate the bellows of my instrument when none of the keys are being pressed or held down by a finger of the player, will give the three open tones, A, E and C, corresponding to three open tones of a ukulele.

It should be further noted that with my apparatus pressing down a given key upon any one of the longitudinal rows makes it impossible to sound a note belonging to any of the preceding keys or the open tone in the same longitudinal row. Thus pressing down upon the key 3° lifts the lefthand valve plate, 16, until the lowest of the ports, 16a, registers with its corresponding opening in the reed block and this necessarily carries the other three ports above the reed block so that the plate, 16, prevents the passage of air through any of the openings in the reed blocks corresponding to such three ports.

It is my purpose to provide an instrument to be used chiefly in playing accompaniments. I have accordingly arranged my valve plates in such a way that there will always be three tones sounded when the bellows is actuated so that the instrument will play chords suitable for accompaniment and these chords can be varied by pressing the different keys.

Likewise, when the key, 2°, is pressed down, it puts the left plate, 16, in a position where the only port through which the air can pass into the reed block, is the next to the lowest port, 16a, in that plate and when the key, 1°, is pressed down, only the second port from the left in the lefthand plate, 16, permits the passage of air to the corresponding opening in the reed block.

The lead lines from the different keys in Figure 7 to the scale shown therein, indicate the different notes or tones which are sounded when the respective keys are depressed.

The keys are arranged in rows transversely of the neck of the instrument so that all three keys in a given row may be held down by one finger of the player and the chord thus formed would be that indicated by the lead lines to the scale shown in Figure 7.

It will be understood that the slots, 20a and 20b, are the same width as the ports, 16a, and the same width as the ports, 21a and 21b, so that when the plate, 16, is shifted to a position where any one of its ports, 16a, is directly opposite one of the openings in the reed block, 24, and registers squarely therewith, the remaining ports in that plate are out of register with any of the openings in the reed block.

It is obvious that with this arrangement, any one of the valve plates will permit the production of four separate tones, only one of which can be produced at a time and that as each valve plate will permit the production of one tone, three tones can always be produced at a given time by actuating the bellows, as each valve plate will always have

However, it should be noted that as the plate, 16, is being moved from one port to another, the two ports may be partly open—that is, partly in register with corresponding openings in the reed block, 24,—at the same time and this will give more or less of a slurring effect, depending upon whether the shifting movement of the plate, 16, is made slowly or rapidly.

I claim:

1. A musical instrument comprising a back, a sound chamber united thereto, a neck united to the sound chamber, bellows having
5 a fixed plate mounted upon the back and a movable plate at the front, a reed block mounted in the sound chamber, air passages leading from the bellows to the reed block, valves interposed in the air passages, keys
10 mounted upon the neck, levers operatively connecting the keys and the valves to actuate the valves when the keys are depressed.

2. A musical instrument comprising a back, a sound chamber united thereto, a neck
15 united to the sound chamber, a pair of bellows mounted upon the back, a reed block containing a plurality of reed chambers slid- ingly mounted in the sound chamber, air passages leading from the bellows to the reed
20 block, valves interposed in the air passages, keys mounted upon the neck, levers opera- tively connecting the keys and the valves to actuate the valves when the keys are de- pressed, and a shifting arm united to the reed
25 block by which same may be readily moved longitudinally.

3. A musical instrument comprising a back, a sound chamber united thereto, a neck
30 united to the sound chamber, a pair of bel- lows mounted upon the back, a reed block containing a plurality of reed chambers slid- ingly mounted in the sound chamber, air pas- sages leading from the bellows to the reed
35 block, valves interposed in the air passages, keys mounted upon the neck, levers opera- tively connecting the keys and the valves to actuate the valves when keys are depressed, and means for shifting the reed block lon- gitudinally.

4. A musical instrument comprising a back, a sound chamber united thereto, a neck
40 united to the sound chamber, a pair of bel- lows mounted upon the back, a reed block containing a plurality of reed chambers in excess of the number of valve ports, and slid-
45 ingly mounted in the sound chamber, air passages leading from the bellows to the reed block, valves containing a plurality of ports interposed in the air passages, keys mounted
50 upon the neck, levers operatively connecting the keys and the valves to actuate the valves when the keys are depressed.

5. In a musical instrument, the combina- tion with a sound chamber, of a reed block
55 slidably mounted therein, containing a plu- rality of reed chambers, means for supplying air under pressure to the several reed cham- bers, manually controllable means for stop- ping the passage of the air to the various reed
60 chambers, and means for adjusting the rela- tive position of the reed block and air supply- ing means adapted to raise or lower the pitch of the instrument.

6. In a musical instrument, the combina-
65 tion with a sound chamber, of a reed block

slidably mounted therein, containing a plu- rality of reed chambers, means for supplying suction to the reed chambers, manually con- trollable means for stopping the suction upon the various reed chambers, and means for ad-
70 justing the relative position of the reed block to the air supplying means adapted to raise or lower the pitch of the instrument.

7. In a musical instrument of the reed-bel- lows type, a reed block suitably mounted
75 therein having a plurality of reed chambers, a bellows mounted adjacent the reed block adapted to receive and transmit air from and to the chambers of the reed block, air pas-
80 sages connecting the bellows and various chambers of the reed block, and a plurality of valve plates intercepting the air passages each having a plurality of ports formed there- in and adapted to be manually actuated.

8. In a musical instrument of the reed-bel- lows type, a reed block suitably mounted
85 therein having a plurality of reed chambers, a bellows mounted adjacent the reed block adapted to receive and transmit air from and to the chambers of the reed block, air pas-
90 sages connecting the bellows and various chambers of the reed block, a plurality of valve plates intercepting the air passages each having a plurality of ports formed therein, and means for actuating the valve
95 plates adapted to open any one of the ports in one or more of the plates at a given time.

9. In a musical instrument, a reed block comprising a plurality of reed chambers regu- larly spaced therein, a plurality of air pas-
100 sages leading to said chambers and corre- spondingly spaced, a plurality of valve plates mounted in the air passages, each valve plate containing a plurality of ports and the ports being spaced to correspond with the air pas-
105 sages and reed chambers and arranged in stepped progression so that but one port in a given plate can be open at a given time.

10. In a reed musical instrument, a reed block comprising a plurality of reed cham-
110 bers regularly spaced therein, a plurality of air passages leading to said chambers and correspondingly spaced, a plurality of valve plates mounted in the air passages, each valve plate containing a plurality of ports and the ports being spaced to correspond with the
115 air passages and reed chambers and arranged in stepped progression so that but one port in a given plate can be open at a given time, and manually operable means for shifting the position of the valve plates independently of each other.

11. In a reed musical instrument, the com- bination with a reed block having a plurality
125 of reed chambers formed therein, of air pas- sages leading to the respective reed cham- bers, means for applying suction or for sup- plying air under pressure to the air passages, a plurality of manually operable keys mount- ed in a plurality of series each series corre-
130

sponding to one reed chamber and each key of each series corresponding to an additional reed chamber, and means whereby one air passage may be opened for each series of keys.

12. In a reed musical instrument, the combination with a reed block having a plurality of reed chambers formed therein, of air passages leading to the respective reed chambers, means for applying suction or for supplying air under pressure to the air passages, a plurality of manually operable keys mounted in a plurality of series, each series corresponding to one reed chamber and each key of each series corresponding to an additional reed chamber, and means whereby one, and only one, air passage may be opened for each series of keys at a given time.

13. In a reed musical instrument, the combination with a reed block containing a plurality of reed chambers, of a pair of bellows, air passages from the bellows to the respective reed chambers, a plurality of series of keys, means operable by the keys for opening or closing each of the air passages so arranged that one, and only one, air passage will normally be opened for each series of keys and each key of a given series will open a different air passage.

14. A musical instrument comprising a back, a sound chamber united thereto, a neck united to the sound chamber, a pair of bellows mounted upon the back, a reed block mounted in the sound chamber, air passages leading from the bellows to the reed block, valves interposed in the air passages, keys mounted upon the neck, levers operatively connecting the keys and the valves in series to actuate the valves progressively when the successive keys are depressed, and spring operated means to return the valves to their normal position when the keys are released.

15. A musical instrument comprising a back, a sound chamber united thereto, a neck united to the sound chamber, a pair of bellows mounted upon the back, a reed block mounted in the sound chamber, air passages leading from the bellows to the reed block, valves interposed in the air passages, keys mounted upon the neck, levers operatively connecting the keys and the valves in series to actuate the valves progressively when the successive keys are depressed, and a spring mounted in the neck bearing against the levers and adapted to hold them in normal position when the keys are not depressed.

16. A musical instrument comprising a back, a sound chamber united thereto, a neck united to the sound chamber, a pair of bellows mounted upon the back, a spring-held reed block containing a plurality of reed chambers slidably mounted in the sound chamber, air passages leading from the bellows to the reed block, valves interposed in the air passages, keys mounted upon the

neck, levers operatively connecting the keys and the valves and adapted to actuate the valves when the keys are depressed, and a shifting arm united to the reed block by which same may be readily moved longitudinally.

17. In a musical instrument, the combination with a sound chamber, of a reed block slidably mounted therein, containing a plurality of reed chambers, means for supplying air under pressure to the several reed chambers, a spring bearing against the reed block adapted to hold it in close contact with the air passages, manually controllable means for stopping the passage of the air to the various reed chambers, and means for adjusting the relative position of the reed block and air supplying means adapted to raise or lower the pitch of the instrument.

18. A musical instrument comprising a back, a sound chamber united thereto, a neck united to the sound chamber, bellows having a fixed plate mounted upon the back and a movable plate at the front, said plates being hinged at the end opposite the neck, a reed block mounted in the sound chamber, air passages leading from the bellows to the reed block, valves interposed in the air passages, keys mounted upon the neck, levers operatively connecting the keys and the valves to actuate the valves when the keys are depressed.

19. A musical instrument comprising a back, a sound chamber united thereto, a neck united to the sound chamber, bellows having a fixed plate mounted upon the back and a movable plate at the front and having a handle united thereto, said plates being hinged at the end opposite the neck, a reed block mounted in the sound chamber, air passages leading from the bellows to the reed block, valves interposed in the air passages, keys mounted upon the neck, levers operatively connecting the keys and the valves to actuate the valves when the keys are depressed.

20. In a wind-reed musical instrument, the combination with a body, of bellows attached thereto, a reed block having a plurality of reeds mounted therein, air passages from the bellows to the reed block, valves to open and close said passages, a plurality of keys, levers connecting the keys and the valves, said keys being arranged in three rows with three keys in each row, and playable from the ukulele fingering as commonly printed upon sheet music.

21. In a musical instrument of the reed-bellows type, the combination with three series of keys having three keys in each series, of a reed corresponding to each of said keys, and three additional reeds corresponding to three open tones produced by three of the strings of a tuned ukulele.

22. In a musical instrument of the reed-

bellows type, the combination with a series of key-actuated reeds, of a plurality of open tone reeds, the open tones and the key tones corresponding to those produced by a standard ukulele.

23. In a musical instrument of the reed-bellows type, the combination with three series of key-actuated reeds, three open tone reeds, the open tones and the key tones corresponding to those produced upon three of the strings of a ukulele, of a reed block slidingly mounted therein.

In testimony whereof he affixes his signature.

DOSSA DIXON EVINS.

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