No. 863,960. PATENTED AUG. 20, 1907.

W. B. YATES.

HARMONICA.

APPLICATION FILED MAR. 19, 1907.

Fig. 1

A

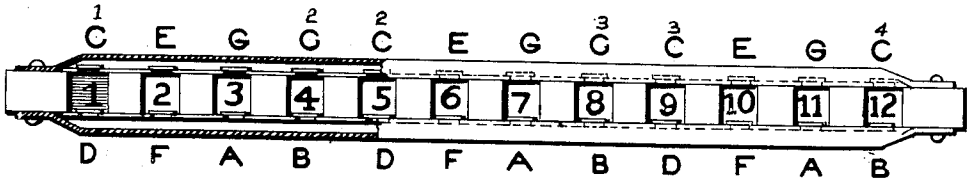


Fig. 2

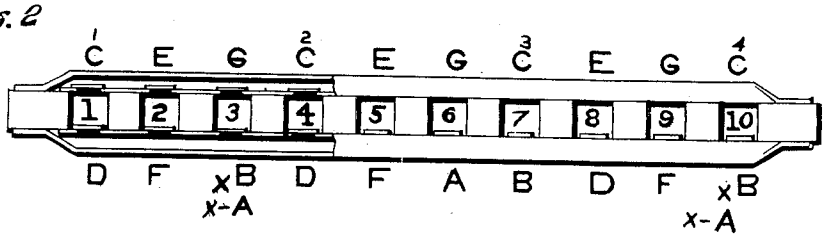


Fig. 3

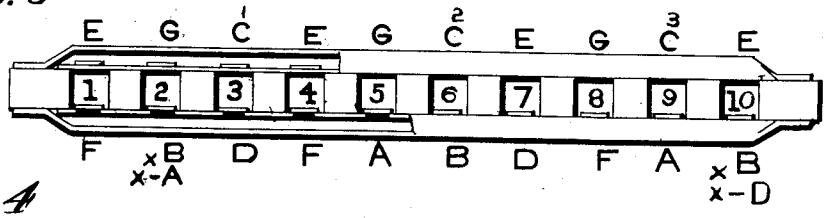
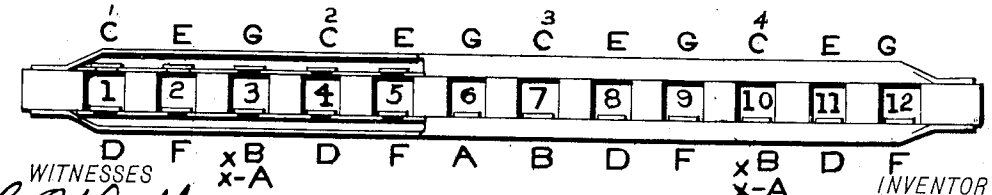


Fig. 4



WITNESSES

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HARMONICA.

No. 863,960. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed March 19, 1907. Serial No. 363,257.

To all whom it may concern:

Be it known that I, WILLIAM BENJAMIN YATES, a citizen of the United States, and a resident of Alviso, in the county of Santa Clara and State of California, have invented an Improved Harmonica, of which the following is a specification.

My invention is an improvement in harmonicas or mouth organs, and has for an object to arrange the harmonica music scale into separate distinct octaves; and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawing, Figure 1 is a plan view of a mouth organ with the scale arranged in accordance with my invention, and some of the reeds indicated in dotted lines, and the casing being broken away to show other reeds; and Figs. 2, 3 and 4 are similar views of mouth organs now in common use.

In the drawing, the harmonica A is provided with a series of openings which I have marked in regular order from 1 to 12, and the reeds are arranged to the tones indicated by the letters C, D, E, F, G, A, B, C, constituting the ordinary diatonic scale. It will be noticed that I repeat the tones at the joining of the octaves; that is to say, I provide in the key illustrated two reeds keyed to C, thus forming what I term for convenience of reference a monotone association between the adjoining octaves.

In the construction shown, the tones C, E, G, C, are arranged to be produced by the exhalation of air by the player, while the tones D, F, A, B, are the tones produced by inhalation.

It will be noticed that the reeds C, E, G, C; C, E, G, C; C, E, G, C, and so on throughout the range of the instrument, are complete in themselves and constitute the chord of the first position.

It will be noticed that the reeds D, F, A, B, complete with their complementary reeds C, E, G, C, their respective octaves, and each of these octaves is complete, or in other words, I do not utilize the terminal reed of one octave as the initial reed of the adjoining octaves, but conjoin the adjoining octaves by repeating the final tone of one octave as the initial tone of the next. This enables me to make each octave complete and to avoid the dropping of the A as is commonly practiced in harmonicas. It may be said to have another advantage, in that as the adjacent reeds C are arranged in unison, they may both be utilized when it is desired to give prominence to the key note of the instrument.

In producing the particular arrangement of reeds, whereby I secure the desired relation described, it will be noticed that in the holes 1, 2 and 3, the reeds are alternated, C being at the upper side, in the illustration, of hole 1, D at the lower side, E at the upper side of hole 2, F at the lower side thereof, G at the upper side of hole 3, and A at the lower side thereof, but B instead of being at the upper side of hole 4, is at the lower side thereof, so that the C may be thrown at the same side of its hole 4 as its octave C is with respect to its hole 1.

It being now apparent that two distinct tones may be produced at each hole, and that a series of four holes consecutively taken, as from 1 to 4 inclusive, will constitute a perfect octave, it is found upon reference to the illustration that the entire range of tones would be made up of distinct, perfect and complete octaves, as from 1 to 4, 5 to 8, 9 to 12, and so on.

From the described arrangement it is evident that the C at hole 5 must be the same tone or in unison with the C at hole 4, such principle holding good for each succeeding octave, and while one of the Cs at holes 4 and 5 and 8 and 9 might be omitted without impairing the harmonic or diatonic progression of the octave or scale, to leave it out would interfere with the numerical order of the scale, it being understood the space occupied by the octave and the tonic as at 4 and 5 and 8 and 9, belong to the distinct octave series whether the tone or space be used or not, it being essential in producing a regular consecutive series of distinct perfect octaves as embodied in a music scale of the harmonica, as will be more clearly understood from the illustration.

Manifestly, the instrument may be made in any key, major or minor, and may embody any suitable number of octaves or fractions of octaves without departing from the invention.

The instrument when made as described, provides a perfected mouth harmonica, perfect in octave, harmonic, diatonic and numerical progression, and capable of producing a greater variety of music than those instruments now in use.

In Figs. 2, 3 and 4, I illustrate some of the mouth organs now in use, and it will be noticed they all three have an imperfect scale. By an improved instrument according to my invention as shown in Fig. 1, and having but 12 holes, a piece of music having a compass of three octaves can be performed, while with the 12-hole instrument shown in Fig. 4, and having the imperfect scale, a composition having a compass of more than one and a half octaves cannot be performed.

I claim:

1. A harmonica or mouth organ, having a series of holes and reeds on opposite sides of said holes and having the reeds arranged in a perfect diatonic scale, with the 1st, 3d and 5th steps arranged on opposite sides of their corresponding holes to the 2d, 4th and 6th steps and with the 7th step on the same side of its hole as the preceding 6th step, and with the terminal tone of one octave re-

peated in the succeeding hole as the initial tone of the succeeding octave, whereby the harmonica music scale is arranged in a series of distinct, perfect and complete octaves, substantially as set forth.

2. A harmonica or mouth organ, having its reeds arranged in a scale having a series of distinct perfect octaves with the reeds of the chords common to the key of the instrument on the same side of the holes, substantially as set forth.

3. A harmonica or mouth organ having a series of distinct, perfect and complete octaves, with the last tone of the preceding octave having the same sound as the first tone of the following octave.

WILLIAM BENJAMIN YATES.

Witnesses:
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