Nov. 29, 1938. V. SKUDIES 2,138,749

HAND HARMONICA

Filed May 25, 1937 3 Sheets-Sheet 1

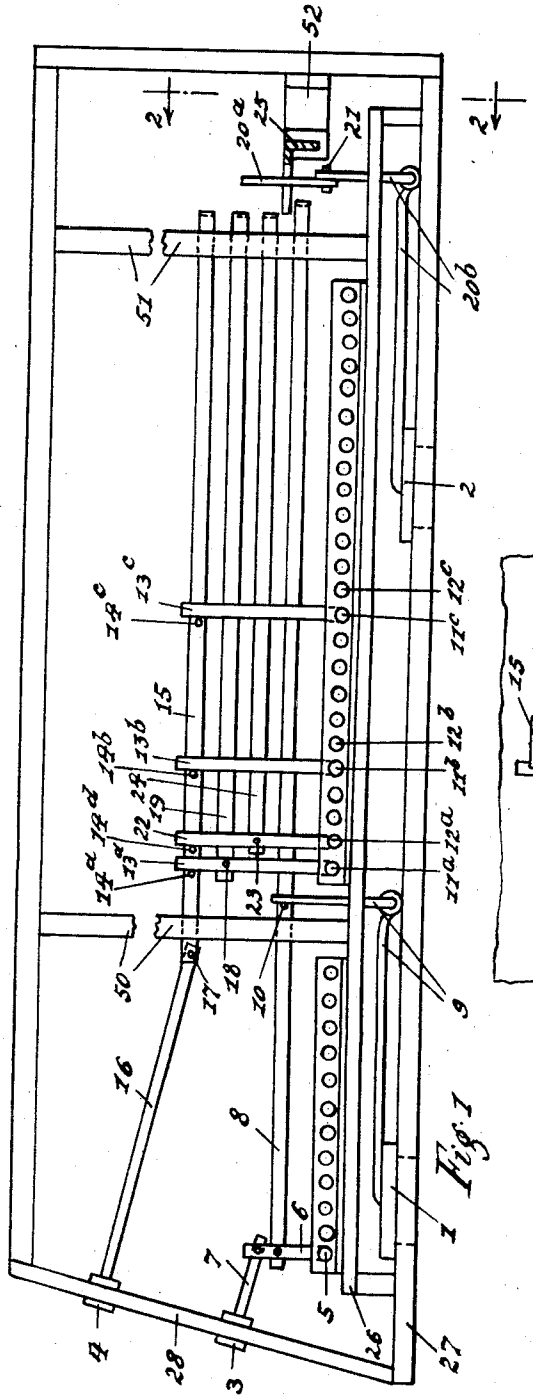


Fig. 1

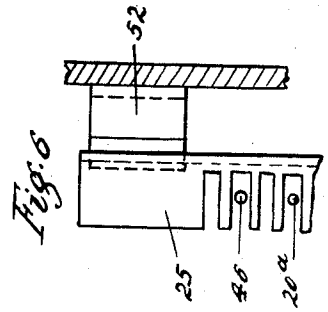


Fig. 6

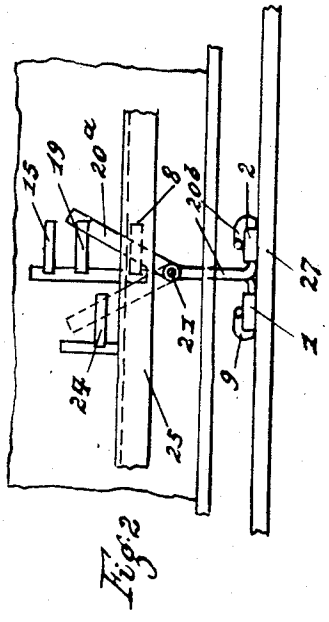


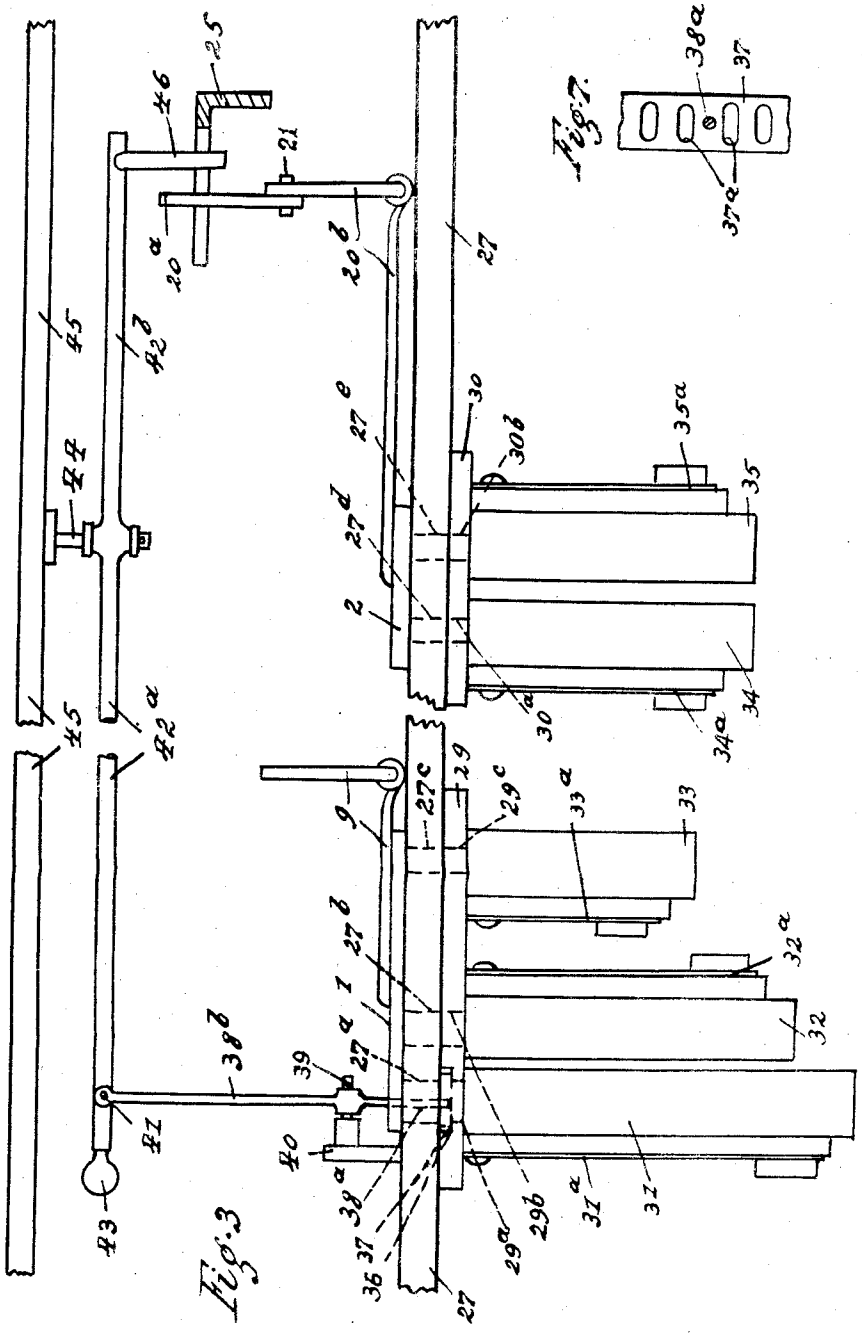
Fig. 2

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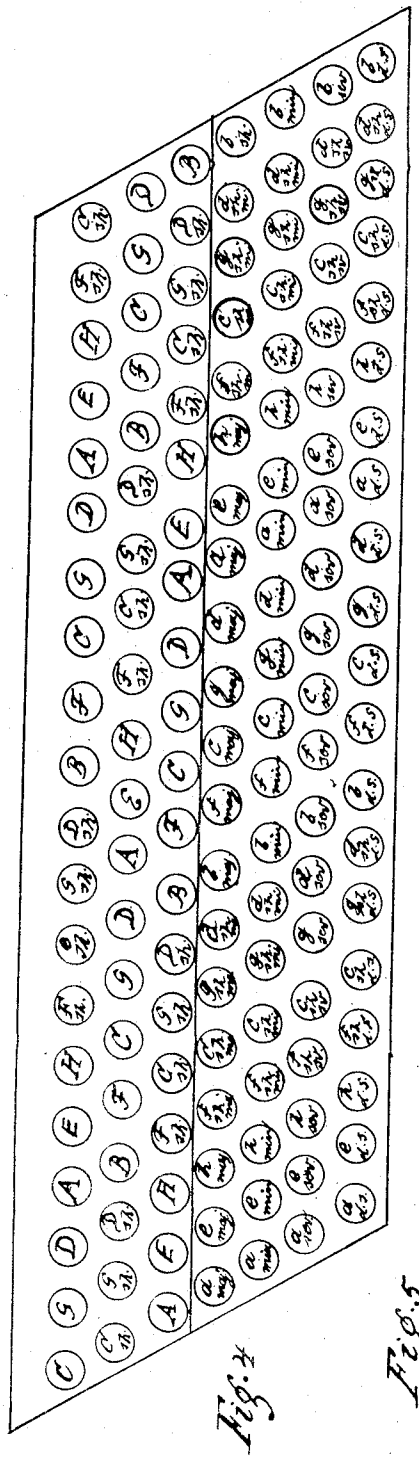


Fig. 4

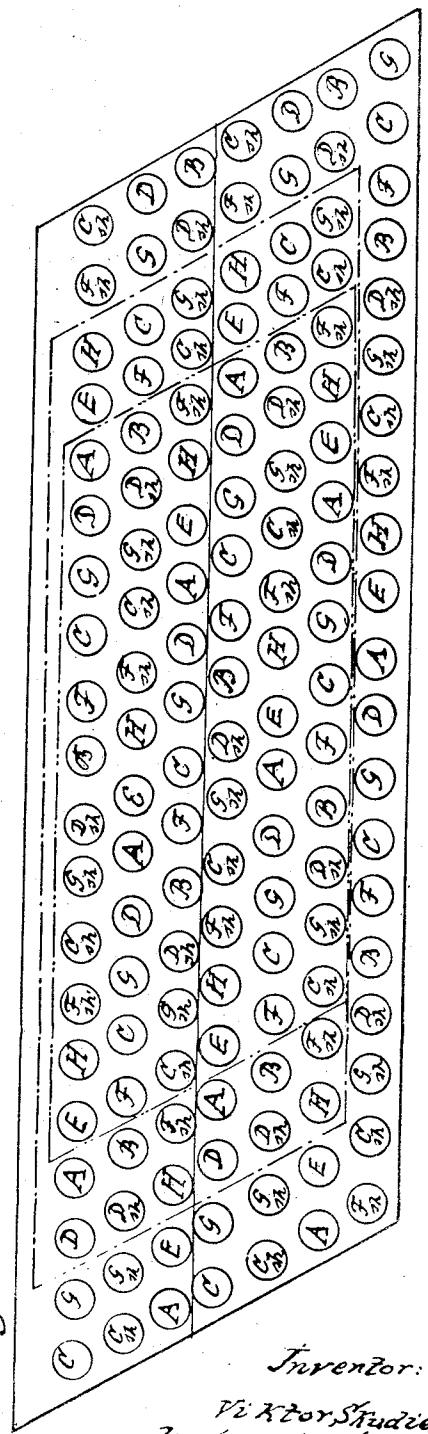


Fig. 5

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HAND HARMONICA

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Application May 25, 1937, Serial No. 144,565
In Germany August 17, 1935

12 Claims. (Cl. 84—376)

The present invention relates to improvements in hand-harmonicas and similar instruments, particularly in that part of such instruments which comprises the bass-mechanism, whereby the push-buttons or keys for operating the accompaniment can, by cutting in a special mechanism and by simultaneously cutting out the coupled accord-mechanism, also be used for producing an interrupted accompaniment.

It is an object of the present invention to provide a hand-harmonica in which the same keys permit the playing of different accompanying accords and in which the change from the accord accompaniment over to the interrupted or broken accompaniment is effected by operation of the coupling shafts, of which twenty-four are provided, which, however, are arranged revolvably only and not displaceably.

A further object of the present invention resides in the provision of a hand-harmonica in which one revolvable coupling shaft is provided in the rear of each revolvable accord-coupling-shaft for the interrupted or broken accompaniment, whereby the finger of said first mentioned coupling shaft can be coupled with the mechanism for the accompanying tones and can as well be brought into the range of the accord key mechanism by means of special rods etc.

Another object of this invention is to provide a hand-harmonica of the type set forth, in which the change from the coupled accompaniment to the interrupted accompaniment is effected by displacing a ledge which removes the accord-key-mechanism out of the range of the bass-key-mechanism.

With the construction of the bass-mechanism according to the invention, the height of the harmonica and its manufacturing cost are considerably reduced, and playing is smoother and more efficient.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and shown in the drawings which, by way of illustration, show what I now consider to be a preferred embodiment of my invention.

In the drawings:

Fig. 1 is a diagrammatic side view of a part of the hand-harmonica according to the present invention showing one valve key for bass and one for the accompaniment;

Fig. 2 is a diagrammatic rear view of the mechanism shown in Fig. 1;

Fig. 3 is a diagrammatic large scale view of the valve keys for bass and accompaniment together with the tuning blocks and the register showing the mode of operation of the latter for operating the bass valve;

Fig. 4 shows the keyboard for the bass mechanism comprising 140 bass keys for coupled accompaniment;

Fig. 5 shows the keyboard for a bass mechanism comprising 140 bass keys when the coupled accord mechanism is cut out and the instrument is ready for interrupted or broken accompaniment;

Fig. 6 is a large scale illustration of part of the comb-like slide member of the change-over mechanism.

Fig. 7 is a top view of part of the register.

Like parts are designated by like numerals and letters in all figures of the drawings.

Referring more particularly to the drawings: 1 designates the bass-valve flap and 2 the flap for the accompaniment. There is, of course, a plurality of each of said valves arranged in several rows on the instrument. 3 designates the button-key for bass and 4 that for the accompaniment, of which there are also a plurality arranged in several rows.

The bass mechanism comprises for each tone a shaft 5 with the post or finger 6 connected thereto or made in one piece therewith, which post is movably connected with the key-rod 7 and the rail 8.

The flap-operating mechanism 9 is carried along by the rail 8 by means of the stud 10.

The mechanism for the accompanying tone comprises the accord-mechanism-shafts 11^a, 11^b, 11^c, and the interposed shafts 12^a, 12^b, 12^c. The posts 13^a, 13^b, 13^c of the shafts 11^a, 11^b, 11^c are engaged by the rail 15 by means of the engaging pieces 14^a, 14^b, 14^c, which rail is linked at 17 to the rod 16 of the accompaniment-key 4.

At 18, the rail 19 serving for operating flap 2 is linked to post 13^a of shaft 11^a. Operation of valve 2 is carried out by means of members 20^a, 20^b which are movably connected with one another at 21.

The post 22 of the interposed shaft 12^a is movably linked to rail 24 at 23 and can be coupled with the rail 15 by means of engaging piece 14^d.

All rails 15, 19, 24, 8 are guided in slots of suitable walls of the instrument, for example 50 and 51, insofar as they penetrate such walls, as shown in Fig. 1; one slot may serve for guiding a plurality of rails, as is shown in Fig. 2 for rails 15, 19, 8. Other suitable means may be employed for guiding the rails.

Members 20^a, 20^b extend through suitable

openings or slots of the suitably displaceable ledge or slide 25 which is connected by means of suitable guides 52 with other parts of the harmonica. For displacing ledge or slide 25, which may have the configuration of a comb, a lever mechanism having a handle or other arrangement which can easily be manipulated may be provided. These means are not shown in the drawing because they are per se known in the art and do not form part of the present invention.

When pushing the slide 25 from right to left, as seen in Fig. 2, member 20a is turned from the position shown in solid lines in Fig. 2 into the position which is shown in dotted lines, so that engagement with rails 19 and 8 is impossible and engagement with rail 24 is made possible. Thereby, with interrupted accompaniment, the mechanism for the accompanying tones is removed from the range of the bass-mechanism, and the accompanying tones are cut off from the bass. By pushing rail 25 to the right, the bass is cut in.

The mechanism proper is mounted to the board 26, and the valve flap 1 for bass and the valve flap 2 for the accompaniment are situated in board 27 which is suitably connected with the casing wall 28 which carries the button keys 3 and 4. The carrying plates 29, 30 for the valve flaps 1, 2 are arranged on the before mentioned board 27. Valve flap 1 operates the tone blocks 31, 32, 33 which are arranged on the carrier plate 29 and provided with the customary tongues 31a, 32a, 33a. The blocks extend through openings 29a, 29b, 29c in carrier plate 29 to corresponding openings 27a, 27b, 27c of board 27, which are covered by flap 1. Likewise, flaps 2 cover the openings 27d, 27e of board 27, which correspond to openings 30a, 30b of the carrier plate 30 for the tone blocks 34, 35, which are also provided with tongues 34a, 35a in known manner. Block 31 is for double-bass, block 32 for bass, and block 33 for the high octave of bass, whereas block 34 is used for the lower octave of second and block 35 for the high octave of second. Block 31 can be cut out by means of register 37 which is set into a recess of the carrier plate 29. The register, which is shown in larger scale in Fig. 7, is provided with openings 37a which are not shown in detail in order not to obscure the drawing and which correspond to openings 27a of board 27, is shifted by means of arm 38a of the two-arm lever 38 which is revolvable about the pin 39 which is supported from board 27 by means of a post 40. The other arm, 38b, of the lever is linked at 41 to one arm 42a of lever 42 which is provided with a handle 43 and swingable in horizontal direction about axle 44 which is connected to the casing cover 45. The other arm, 42b, of lever 42 extends with the extension 46 into the rail 25 and adjusts the latter simultaneously with the register. Adjustment of rail 25 was explained in connection with Fig. 2.

The position of the button-keys forms the key table which is shown in Figs. 4 and 5 for a bass mechanism having 140 basses.

The two first rows from the top form the change-basses for minor and major thirds, whereas the third row from the top consists of the keys for the ground basses. The fourth to the seventh rows, inclusive, show the keys for the accords; the fourth row from the top comprises the keys for the major accords, the fifth row the keys for the minor accords, the sixth row the keys for the septime accords, and the seventh row the keys for the reduced septime accords.

In Fig. 5, the same key table is shown, whereby the tones corresponding to the individual keys are shown as they are after cutting out of the coupled accord mechanism and cutting in the mechanism for playing the interrupted accompaniment.

The first, second and third rows show the keys for the basses without high octaves, whereas the fourth, fifth, sixth, and seventh rows show the individual tones which replace the accords.

Fig. 5, by means of the dash and dotted line frame, shows further the bass and accompaniment system for a mechanism with 96 and 72 bass keys. From this figure can be seen that, also when reducing the bass mechanism in such manner, the method of playing, namely, particularly the fingering, is substantially the same. For the player it is, therefore, easily possible to change over from a small to a large bass mechanism and vice versa without additional practice. It further shows that division and arrangement of the whole keyboard can substantially be retained in bass mechanisms with wide differences in the number of keys, which greatly reduces manufacturing cost of various size harmonicas according to the present invention.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

What I claim is:

1. In a hand-harmonica, the combination of two sets of valves, two sets of keys, connecting means permanently individually interconnecting the valves of one of said valve sets with the keys of one of said key sets, disconnectable coupling means individually, disconnectably interconnecting said connecting means and the valves of the other valve set, and other connecting means individually interconnecting the keys of the other of said key sets with said coupling whereby the keys of one of said key sets can be made to operate valves of both valve sets or the valves of any one set and whereby, at the same time, valves of the other set of valves can be operated by the keys of the other key set.

2. In a hand-harmonica, the combination of two sets of valves, two sets of keys, connecting means permanently individually interconnecting the valves of one of said valve sets with the keys of one of said key sets, coupling means permanently individually connected with the valves of the other valve set and individually having control members which are movable into different positions and which are individually engaged by said connecting means when in one of said positions, and other connecting means individually connected with the keys of the other of said key sets and engaging a plurality of said control members when in said one of said positions whereby upon depression of a key of one key set valves of both valve sets are operated and upon depression of one key of the other key set a plurality of valves of the other valve set are operated.

3. In a hand-harmonica, the combination of two sets of valves, two sets of keys, connecting means permanently individually interconnecting the valves of one of said valve sets with the keys of one of said key sets, coupling means permanently individually connected with the valves of the other valve set and individually having control members which are movable into different

positions and which are individually engaged by said connecting means when in one of said positions and which are not engaged by said connecting means when in another of said positions, and other connecting means individually connected with the keys of the other of said key sets and engaging a plurality of said control members when in said one of said positions whereby upon depression of a key of one key set valves of both valve sets are operated and upon depression of one key of the other key set a plurality of valves of the other valve set are operated, and individually engaging individuals of said control members when in said other of said positions whereby upon depression of a key of one key set a valve of one valve set is operated and on depression of a key of the other key set a valve of the other valve set is operated.

4. In a hand-harmonica, the combination of a bass valve, a valve for the accompaniment, a bass button key, connecting means connected to and operatively interconnecting said bass button key and both said valves, said connecting means comprising a disconnectable coupling means interposed in said connecting means and between said bass valve and said valve for the accompaniment for disconnecting said valve for the accompaniment from said bass button and coupling said valve for the accompaniment with said bass button, an accompaniment button key, accompaniment connecting means connected to and interconnecting said last mentioned key and said valve for the accompaniment and being independent from said first mentioned connecting means.

5. In a hand-harmonica, the combination of a bass valve, a valve for the accompaniment, a bass button key, connecting means connected to and operatively interconnecting said bass button key and said valves, said connecting means comprising a disconnectable coupling means interposed in said connecting means and between said bass valve and said valve for the accompaniment for disconnecting said valve for the accompaniment from said bass button key and coupling said valve for the accompaniment with said bass button key, an accompaniment button key, accompaniment connecting means connected to and interconnecting said last mentioned key and said coupling means and being independent from said first mentioned connecting means, said coupling means comprising a member which is permanently rigidly connected with said valve for the accompaniment and a swingable member movably linked to said first mentioned member and having two different positions and being, in one of said positions, abuttingly operatively connected with and operated by said independent accompaniment connecting means and, in the other position, being adapted to abuttingly engage both said first mentioned connecting means and said accompaniment connecting means.

6. In a hand-harmonica, the combination of a bass valve, a valve for the accompaniment, a bass button key, connecting means connected to and operatively interconnecting said bass button key and both said valves, said connecting means comprising a disconnectable coupling means interposed in said connecting means and between said bass valve and said valve for the accompaniment for disconnecting said valve for the accompaniment from said bass button key and coupling said valve for the accompaniment with said bass button key, an accompaniment button key, accompaniment connecting means connected to and interconnecting said last mentioned key and said coupling means and being independent from said first mentioned connecting means, said coupling means comprising a member which is permanently rigidly connected with said valve for the accompaniment and a swingable member movably linked to said first mentioned member and having two different positions and being, in one of said positions, abuttingly operatively connected with and operated by said accompaniment connecting means and, in the other position, being adapted to abuttingly engage said first mentioned connecting means and said accompaniment connecting means, and a laterally displaceable comb shaped member movably connected with and swinging said swingable member from one position into the other.

7. A hand-harmonica having a keyboard, having seven rows of button keys, bass button keys making up the third of said rows of keys, accompaniment button keys making up the fourth, fifth, sixth, and seventh of said rows of keys, bass valves, valves for the accompaniment, connecting means individually connected to and interconnecting said bass button keys and one of said bass valves and one of said valves for the accompaniment, said connecting means comprising disconnectable coupling means interposed in said connecting means for coupling said valve for the accompaniment to or disconnecting it from said bass button key, and accompaniment connecting means connected to and individually and independently of said bass button keys and first mentioned connecting means interconnecting said keys of the fourth to the seventh row of keys and said valves for the accompaniment.

8. A hand-harmonica comprising a bass valve, a valve for the accompaniment, a bass button key, connecting means connected to and operatively interconnecting said key and both said valves, a disconnectable coupling means interposed in said connecting means and between said valves whereby either one or both said valves can be operatively connected with said key, a tone block having openings, and a displaceable tone block valve member movably connected with said tone block adjacent to and controlling said openings, said valve member being operatively connected and simultaneously operated with said coupling means.

9. A hand-harmonica comprising a bass valve, a valve for the accompaniment, a bass button key, connecting means connected to and operatively interconnecting said key and both said valves, a disconnectable coupling means interposed in said connecting means and between said valves whereby either one or both said valves can be operatively connected with said key, a tone block having openings, a displaceable tone block valve member movably connected with said tone block adjacent to and controlling said openings, and an operating lever connected with said tone block valve member as well as with said coupling means which lever simultaneously operates said valve member and coupling means.

10. A hand-harmonica comprising a bass valve, a valve for the accompaniment, a bass button key, connecting means connected to and operatively interconnecting said key and both said valves, a disconnectable coupling means interposed in said connecting means and between said valves whereby either one or both said valves can be operatively connected with said key, a tone block having air flow openings, a displaceable tone block valve member movably connected with said tone block adjacent to and controlling the

air flow through said openings, a lever having a handle and being connected with said coupling means, and another lever connected with one end to said first mentioned lever and with the other end to said valve member and being disposed and swinging in a plane which is substantially rectangular to the plane in which said first mentioned lever moves which levers simultaneously operate said valve member and coupling means.

11. In a hand-harmonica, the combination of a bass key, a bass valve, connecting means connecting said bass key and said bass valve, an extension on said connecting means, an accompaniment valve, a coupling connected with said accompaniment valve and having a control member which is movable into two extreme positions and which member, in one extreme position, is abuttingly engaged by said extension and operates upon depression of said bass key said accompaniment valve and which member, in the other extreme position, is not engaged by said extension and does not operate said accompaniment valve upon depression of said bass key, an accompaniment key, and means connecting said accompaniment key and said control member in any of its extreme positions and operating said accompaniment valve at any extreme position of said member upon manipulation of said accompaniment key.

12. In a hand-harmonica, the combination of a bass key, a bass valve, connecting means connecting said bass key and said bass valve, an extension on said connecting means, an accompaniment valve, a coupling connected with said accompaniment valve and having a control member which is movable into two extreme positions and which member, in one extreme position, is abuttingly engaged by said extension and operates said accompaniment valve upon depression of said bass key and which control member, in the other extreme position, is not engaged by said extension and does not operate said accompaniment valve upon depression of said bass key, an accompaniment key, and means connecting said accompaniment key and said control member in any of its extreme positions and operating said accompaniment valve at any extreme position of said member upon manipulation of said accompaniment key, said last mentioned means comprising at least two rotatable axially unmovable shaft-members, a lever member connected with each of said shaft members, a connecting rod connecting both said lever member with said accompaniment key, an individual connecting rod connected with each of said shaft members, one of said individual connecting rods abuttingly engaging said movable member when in one extreme position and the other of said individual connecting rods abuttingly engaging said movable member when in the other extreme position.

VIKTOR SKUDIES.