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F. H. MAGNUS

2,407,312

PLASTIC HARMONICA

Filed Feb. 20, 1943

Fig. 1

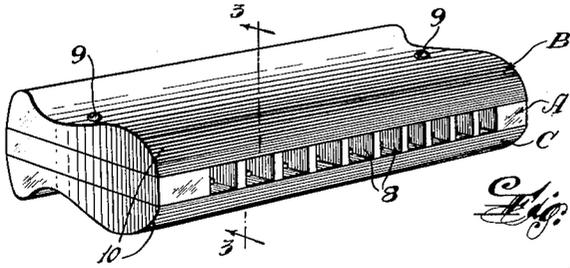


Fig. 2

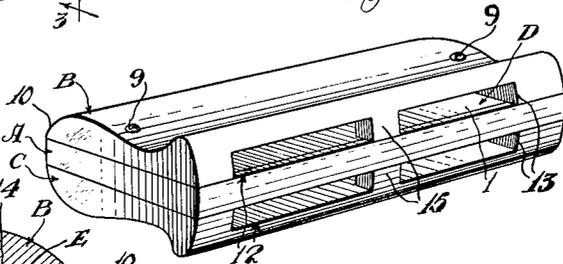


Fig. 3

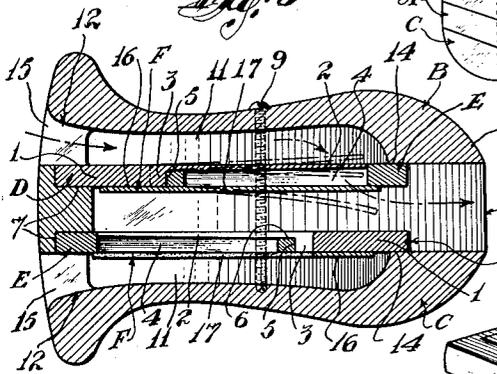


Fig. 6

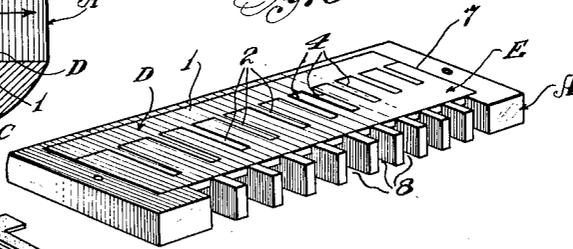


Fig. 7

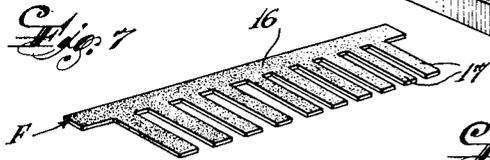


Fig. 4

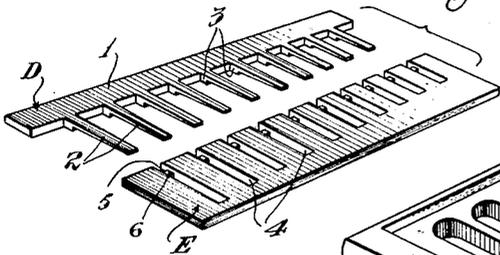
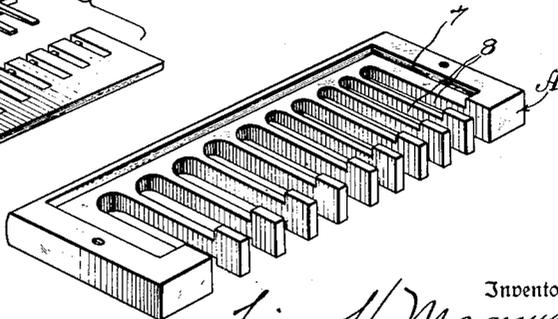


Fig. 5



39

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UNITED STATES PATENT OFFICE

2,407,312

PLASTIC HARMONICA

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Application February 20, 1943, Serial No. 476,517

5 Claims. (Cl. 84-377)

1

This invention relates in general to harmonicas, particularly harmonicas in which the reeds or reed plate, or both the reeds and reed plate are formed of a plastic composition, as described in my copending application Serial No. 467,679, filed December 3, 1942.

In the manufacture of harmonicas having the reeds formed of metal, such as brass, considerable difficulty has been encountered in tuning the reeds. The riveting of the reeds upon the reed plate often changes the tone of the reed.

Furthermore, variations in the compositions of the alloys, and heat treatment and rolling of the metals during manufacture, affect the tonal qualities of the metals. Therefore, hand tuning, as by grinding, of practically all of the reeds in each instrument is necessary, which is a slow and tedious operation.

With my invention as disclosed in my aforesaid application and as will be hereinafter described, the reeds are formed of a plastic composition which is molded so that the reeds can be produced initially in tune and the reeds can be molded integrally with the reed plates or secured thereto adhesively. Riveting or similar fastening operations thereby are eliminated and the necessity for hand tuning is obviated.

A prime object of the present invention is to provide a novel and improved construction and combination of reeds and a reed plate to facilitate integral molding of a plurality of reeds and to expedite assembly of said reeds with the reed plate, whereby the reeds can be molded in tune and all of the reeds can be mounted in proper relation to the reed plate in one and the same operation and without the necessity for riveting or similar fastening operations.

Another object is to provide a novel and improved structure such that a plurality of reeds of different tones can be integrally formed in proper relation to each other and handled as a unitary reed board or reed stick, whereby individual handling and fastening of the reeds on a reed plate shall be obviated.

A further object is to provide a novel and improved reed plate to cooperate with said reed board or reed stick and having a slot for each reed, so that said reeds can be mounted in their respective slots in one and the same operation by simply arranging said reed stick and said reed plate in a certain relation to each other.

Another object is to provide a novel and improved construction and combination of a reed stick, a reed plate and a wind cell block to facilitate mounting and holding said reeds and their

2

corresponding slots in the plate in proper relation to the respective wind cells.

Further objects are to provide a novel and improved reed slot valve unit which shall permit a plurality of valve flaps to be handled as a unit to facilitate application thereof to a harmonica; and to provide such a unit which shall be moisture-resistant and non-corrosive and wherein the reed-damping flaps shall be highly flexible and resilient.

Other objects, advantages and results of the invention will be brought out by the following description in conjunction with the accompanying drawing in which

Figure 1 is a front perspective view of a harmonica embodying my invention.

Figure 2 is a rear perspective view thereof.

Figure 3 is an enlarged transverse vertical sectional view on the line 3-3 of Figure 1.

Figure 4 is a composite perspective view of the reed board or reed stick and the reed plate.

Figure 5 is a perspective view of the wind cell block.

Figure 6 is a perspective view of the wind cell block and the reed stick and reed plate in assembled relation, and

Figure 7 is a perspective view of the reed damping unit.

For the purpose of illustrating the invention I have shown it in a harmonica which includes a body or casing comprising a wind cell block A and two cover or sound chamber sections B and C which are mounted on opposite sides of the wind cell block.

Important features of the invention are the reed stick or reed board D, the reed plate E and their combination with each other and with the wind cell block A.

The reed stick D comprises an elongate flat body 1 which has a plurality of reeds 2 projecting from one edge thereof in spaced, parallel and side-by-side relation to each other. As shown, the body 1 and the reeds 2 are formed integrally and in accordance with the preferred embodiment of the invention are composed of a plastic composition such as "Polystyrene." As shown, the body 1 has a plurality of lugs 3 projecting from one edge thereof from each of which projects one of the reeds 2, so that each lug in effect forms a base for the corresponding reed.

The invention particularly contemplates the molding of the reed stick D from a moldable plastic composition such as "Polystyrene," and the molding of the reeds 2 in tune, so that the reeds may be handled simultaneously as a unit and

assembled with the reed plate without riveting or other fastening operations and without the necessity for individual tuning of the reeds. It will be understood that the reeds will be of sizes and shapes to produce the desired musical tones, as usual. Where the reeds are formed of "Polystyrene" or the like they will vary in thickness from .022 inch to .026 inch at their juncture with the lugs 3, and will decrease in thickness from their bases to their free ends so that the thicknesses at the ends of the reeds will be from .010 to .016 inch.

The reed plate E has a plurality of reed slots 4, one for each reed, and has a notch 5 in one edge thereof in alignment with each slot to receive one of the lugs 3 of the reed stick. In assembling the reed stick and the reed plate they are arranged in edge-to-edge relation with the lugs 3 in the corresponding notches 5 and with one of the reeds 2 in each slot 4. Preferably the reed plate has a cut away portion 6 between the base of each notch 5 and the end of the corresponding reed slot 4, in which the corresponding reed 2 is seated. With the parts thus assembled the reed stick D and the reed plate E are disposed in substantially a common plane as shown in Figure 3, and the reeds are free to vibrate in their respective slots upon passage of air currents through the latter.

In accordance with the form of the invention illustrated there is a reed stick and a corresponding reed plate at each of opposite sides of the wind cell block A, and as shown, the wind cell block has a recess 7 at each side thereof in which the corresponding reed stick and reed plate are seated as shown in Figure 6. The reed stick D and reed plate E at one side of the wind cell block are arranged so that the reeds thereof shall serve as "blow" or exhale reeds, while the reed stick and reed plate at the other side of the block are so disposed that the reeds will serve as inhale or "draw" reeds.

One "blow" reed and one exhale reed are arranged one above the other so as to constitute a pair, and the wind cell block A has a plurality of slots 8, one for each pair of reeds. As shown, these slots open through both sides of the wind cell block and through one edge thereof which serves as a mouth-piece for the instrument.

The two casing sections B and C are shown as substantially identical in construction and are secured at opposite sides of the wind cell block A in any suitable manner as by screws 9. One edge of each casing section tightly fits against the corresponding side of the wind cell block at the edge thereof through which open the wind cells 8 and said edges are smooth and rounded as indicated at 10 so as to form smooth and comfortable surfaces for the lips of the player and to cooperate with the edge of the wind cell block to form a mouth-piece. Each casing section B and C has a sound chamber 11 in communication with the reed slots 4 of the respective reed plate, said sound chambers opening at the rear of the instrument as indicated at 12. Preferably each casing section B and C has portions 13 overlying the ends of the corresponding reed plate, a portion 14 overlying the forward edge of the reed plate and one or more lugs or ribs 15 intermediate the length of the corresponding sound chamber to overlie the rear edge of the corresponding reed plate.

With this construction the reed plates and reed sticks are firmly held in proper position and

against warping, without the necessity for separate fastener elements.

As shown in Figure 3, it is desirable that the "draw" reeds, which are shown at the upper portion of said figure be located nearer the mouth-piece than the "blow" reeds so that the velocity of air passing around the "draw" reeds shall be substantially the same as the velocity of air current passing around the "blow" reeds, thereby to ensure approximately the same volume of tone from the "draw" reeds and "blow" reeds.

Another feature of the invention is a slot-valve unit which is shown as comprising an elongate body 16 of suitable flexible material, preferably of plastic composition such as "Polystyrene," from one edge of which integrally projects a plurality of valve flaps 17 one for each reed. When the unit is formed of a plastic composition such as "Polystyrene" it is moisture resistant and non-corrosive and the damping flaps 17 are highly resilient and flexible. It is possible to form these flaps of a thickness of about .010 inch so that they will be readily sensitive to air currents flowing through the slots in the proper direction. As usual, the valve flaps 17 will be applied over the "blow" reed slots at the side of the reed plate opposite the mouth-piece while the valve flaps for the "draw" reed slots will be applied thereover at the side of the reed plate nearer the mouth-piece as shown in Figure 3. With the unit embodying the invention, all of the flaps may be handled at the same time and may be secured to the corresponding reed stick 1 by adhesively or otherwise attaching the body 16 to the reed stick.

It will be understood by those skilled in the art that the reed sticks, reed plates, wind cell blocks and valve units, may be die cut instead of molded. However, when the reeds are die-cut from sheets, it will be necessary to individually tune them as by shaving or grinding them.

Many other modifications and changes in the details of structure of the harmonica and the method of making and assembling the parts will occur to those skilled in the art as within the spirit and scope of the invention.

What I claim is:

1. For a harmonica, the combination of an elongate flat body of plastic material having a plurality of lugs projecting integrally from one edge thereof in spaced relation to each other and each having a reed projecting integrally therefrom, and a reed plate having a plurality of reed slots and also having notches in one edge each in alignment with one slot, one of said lugs being seated in each said notch, and the corresponding reed being disposed in the slot that is aligned with said lug.

2. For a harmonica, the combination of an elongate flat body of plastic material having a plurality of lugs projecting integrally from one edge thereof in spaced relation to each other and each having a reed projecting integrally therefrom, and a reed plate having a plurality of reed slots and also having notches in one edge and grooves leading from said slots to said notches, each notch and corresponding groove being in alignment with one slot, one of said lugs being seated in each said notch, and the corresponding reed being disposed in the groove and the slot that are aligned with the lug.

3. In a harmonica, a casing including a wind cell block having a plurality of wind cells opening through one edge and at least one side thereof, a reed plate mounted on said side of said wind-cell block and having a reed slot for each

5

cell, a reed unit comprising a flat elongate body mounted on said side of the bell block and having a plurality of reeds projecting from one edge thereof, said body being arranged in edge to edge relation to said reed plate with one of said reeds disposed in each said reed slot, said cell block having a recess in said side thereof in which said reed plate and said reed unit are seated, and a casing section secured to said cell block above said reed plate and reeds and having a sound chamber.

4. For a harmonica, an elongate flat body of

6

plastic material having a plurality of molded tuned reeds of varying thickness which were molded in tune projecting integrally from one edge thereof in spaced relation to each other longitudinally of said body in the order of their tones.

5. For a harmonica, a molded elongate flat body of plastic material having a plurality of molded tuned reeds which were molded in tune projecting integrally therefrom in spaced relation to each other.

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