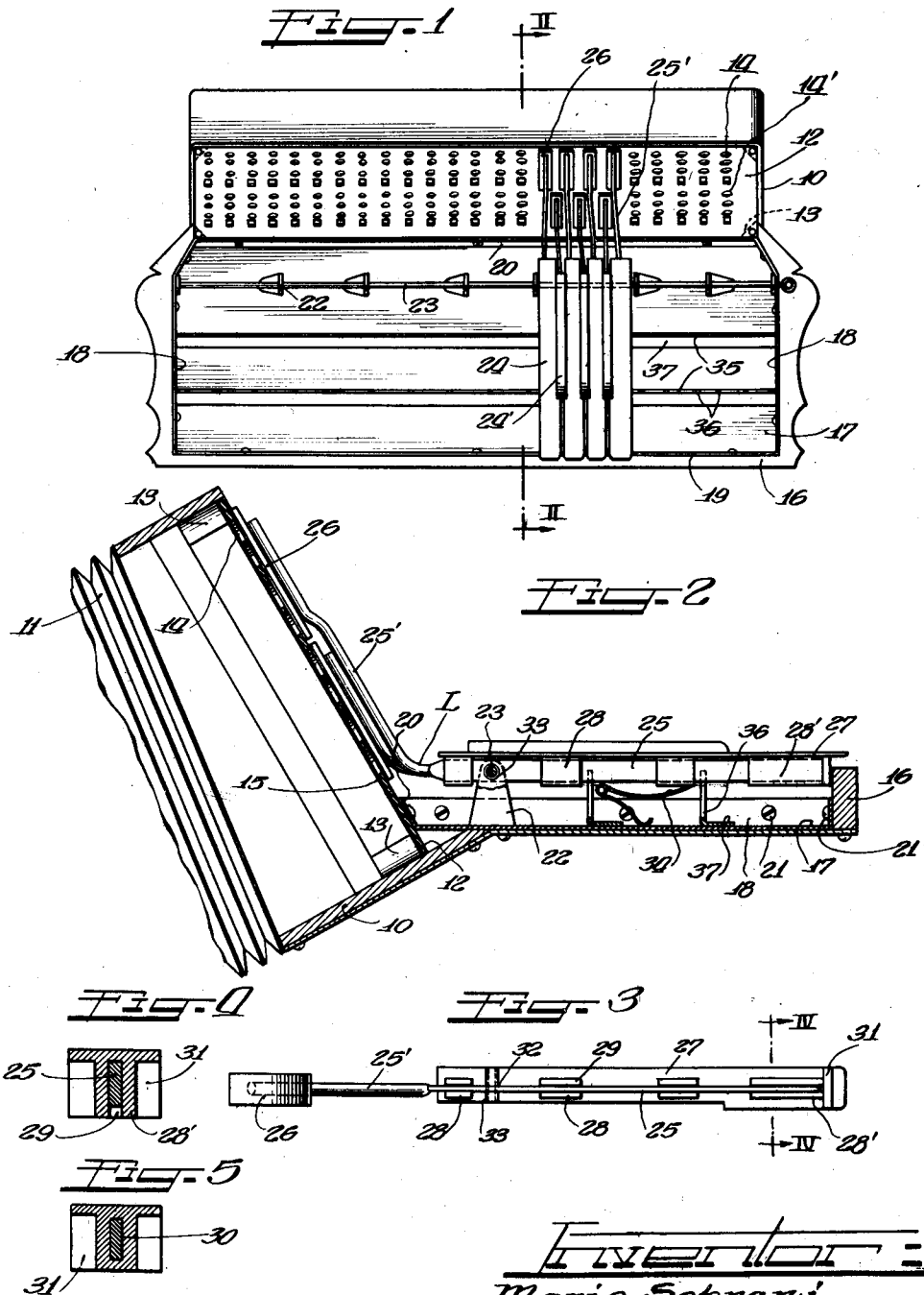


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PIANO KEY ACTION FOR ACCORDIONS

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PIANO-KEY ACTION FOR ACCORDIONS

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My invention relates to accordions and particularly to the piano key action and supporting key board structure therefor.

An important object of the invention is to eliminate the use of wood for supporting the keys by providing a key supporting board or frame constructed of light sheet metal such as aluminum.

A further object is to provide a sheet metal key supporting board which although of light weight is very strong and rigid and on which the keys may be readily assembled and held in accurate alignment.

Another important object of the invention is to eliminate the use of wood in the key structure and substitute light metal such as aluminum.

Another object is to provide key bodies formed or molded of celluloid, bakelite, or other special material or composition which is durable and light.

Another important feature is to reduce as much as possible the amount of material in the key body in order to procure lightness, but to distribute the material so that the necessary strength will be provided to hold the key body rigid against flexing or distorting.

A further object is to provide an integral metallic key lever in the form of a metal rod for supporting a valve at one end and at its other end being shaped to be readily secured to the key body to form a rigid support therefor, the outer end of the lever being preferably flattened and the key body being provided with grooves or passageways into which the flattened end may be readily received and secured so that the lever will support and reinforce the key body.

The above enumerated features and other features of my invention are incorporated in the structure shown on the drawings, in which drawings;

Figure 1 is a plan view of an accordion with parts removed to disclose my improved key board and key structure arrangement;

Figure 2 is a section on plane II—II of Figure 1;

Figure 3 is an underside view of a key structure;

Figure 4 is an enlarged section on plane IV—IV of Figure 3; and

Figure 5 is a similar section, showing a modified arrangement.

On the structure shown, the rectangular frame 10, which is usually of wood, forms the inner head or chest between which and an outer head or chest (not shown) is interposed the bellows 11. The outer end of this frame is closed by a metal plate 12 which may be of aluminum, and the plate is supported on lugs or brackets 13 extending from frame 10. The plate has properly arranged ports or air passages 14 which communicate with the tone producing units (not shown), usually in the form of reed structures. To insure accurate and air tight seating for the reed units, the inner side of the plate 14 is provided with a layer or lining 15 of material such as soft leather.

Extending at the proper angle from the frame 10 is the rectangular frame 16, usually of wood, for the key board structure, the two frames being suitably secured together. Fitting within the frame 16 and forming a bottom therefor, is the sheet metal frame or key board 17 for supporting the piano key structure. This frame may be in the form of a flat plate of metal such as aluminum and has its end sections deflected to form the end flanges 18, the front flanges 19, and the rear flange 20, this flange 20 being at an angle so that it will fit against the plate 12 to which it is rigidly secured as by riveting, welding, or otherwise, so that the plate 12 and the frame 17 will form a rigid metallic structure for reinforcing the wood frame work 10 and 16.

The key board frame 17 may be rigidly secured to the frame 16 as by means of screws 21. Adjacent to its rear edge the plate has struck upwardly therefrom a row of ears 22 having aligned openings for receiving a fulcrum rod 23 which may be in the form of a length of wire. This rod may readily be inserted through one end flange 18 and extended through the openings of the ears 22 and with its end then extending through the opposite end flange to be supported thereby so that the rod, when inserted, will be rigidly

supported by the frame 17 in proper alignment to form a fulcrum support for the natural or white keys 24 and the accidental or black keys 24', these keys being grouped and arranged to form the piano key assembly, as is well understood in the art. To assist in properly grouping the keys, the ears 22 are spaced accordingly.

Each key is supported by a lever structure or L, whose outer and inner sections 25 and 25' are at an angle with each other, the outer ends of the levers supporting the key bodies and the inner ends of the levers supporting the valves 26. As clearly shown in Figure 1, the valves for the white keys control the ports 14 along the outer section of the plate 12, and the valves for the black keys control the ports 14' along the inner section of the plate.

The key levers may be formed integral from lengths of wire of suitable material, such as aluminum which is strong and light. The outer section 25 of each lever is formed by flattening the wire to rectangular cross-section so that these outer sections are of flat bar shape as clearly shown in Figures 4 and 5.

The bodies of the keys are preferably formed integral by being molded from suitable material such as celluloid or phenol condensation products. As shown, the body of each white key comprises a top or fingering plate 27 with lugs 28 depending therefrom and adapted to securely receive the front end 25 of the supporting lever. As shown in Figure 4, these lugs may have aligned vertical slots 29 open at their lower ends for the lateral insertion and reception of the flat lever ends. In the arrangement shown in Figure 5, the lugs have aligned closed passageways 30 through which the lever end may be inserted longitudinally of the key body. The lug 28' at the front end of each white key may be longer than the other lugs in order to give added strength to the outer end of the key, and a finish or end flange 31 is provided at the outer end of the lug 28' and set inwardly a distance from the outer end of the fingering top 27, this flange forming also a stop for gauging the position of the lever supporting end 25 when it is applied to the key body. The black key bodies are secured to their supporting levers in a manner similar to that provided for the white keys.

Near its inner end, each lever section 25 has an opening 32 therethrough for the insertion of a bearing bushing 33 which may be a short length of tubing. These bushings receive the fulcrum rod 23, the rod being progressively inserted through the bushings as the keys are progressively assembled on the key board. The bushings, by forming extended bearings, will hold the key structures against lateral rocking or displacement, and the bushings may abut each other and the ears 22 so that the key structures will be

held against lateral shifting on the fulcrum rod, and with their valves at all times in accurate alignment and cooperative position relative to the valve ports 14 to control the flow of air for the reed units.

A suitable spring structure 34 is provided for each key structure to normally hold the key body in its upper position and the corresponding valve seated against the plate 12. The spring structure shown is U-shape with its upper leg secured at its end to the key body and its lower leg abutting against the inner side of the key board frame 17, as clearly shown in Figure 2.

To assist in guiding the movement of the key structures and maintain the lateral alignment thereof on the key board, guide ribs or walls 35 are provided with guide slots 36 which receive the ends 25 of the key levers. These guide walls may be of aluminum and may have flanges 37 by means of which they may be secured to the key board frame 17 by riveting, welding, or otherwise.

The all-metal key supporting frame 17 together with the metal valve plate 12 to which it is secured forms a very rigid but light metal reinforcement for the accordion structure and holds the key board in accurate alignment with the valve seating plate and prevents distortion so that the valves will always be accurately seated. The elimination of wood from the key structure and the support and reinforcement of the key bodies by the integral metal key levers produces a very strong and rigid, yet light structure, and the key top or fingering surfaces will always remain straight and flat and in accurate alignment with each other.

Although I have shown and described one practical and efficient embodiment of the features of my invention, it is to be understood that changes and modifications may be made without departing from the scope and principles of the invention, and I do not, therefore, desire to be limited as is specified in the appended claims.

I claim as follows:

1. The combination of a sheet metal valve plate, a sheet metal key supporting frame extending from and rigidly secured to said valve plate, sections deflected from said frame forming a row of upstanding ears on said frame, a fulcrum rod supported by said ears, integral metallic key levers fulcrumed on said rod, valves on said key levers for cooperating with ports through said valve plate, and key bodies mounted on the outer ends of said levers.

2. In a musical instrument of the class described, a valve plate having air ports, a key supporting frame constructed of sheet metal and rigidly secured to said valve plate, a row of ears integral with and deflected from said frame, a fulcrum rod supported by said ears, key levers fulcrumed on said rod, and valves

on said key levers for cooperating with said ports.

3. In a musical instrument of the class described, the combination with the instrument body, a valve plate on said body having
5 ports, a key board extending from said body, said key board being constructed entirely of light sheet metal, a row of ears deflected from said key board, a fulcrum shaft supported by
10 said ears, keys fulcrumed on said rod, valves on said keys for cooperating with said ports, and slotted sheet metal guide walls for said keys secured to said key board.

4. In a musical instrument of the class described, the combination of a sheet metal
15 valve plate having ports, a key supporting frame constructed of sheet metal and secured to said valve plate, sections deflected upwardly from said key supporting frame to form a longitudinal row of ears, a fulcrum rod supported
20 by said ears, integral metallic key levers fulcrumed on said rod, valves on the inner ends of said levers for cooperating with said ports, and integral key bodies mounted
25 on the outer ends of said levers.

5. In a musical instrument of the class described, the combination of a piano key board, a fulcrum rod supported on said board, key
30 levers fulcrumed on said rod, each lever being a length of wire having its outer end flattened and disposed in a plane at right angles with said board, a key body for each lever having passageways for receiving the
35 flattened end thereof to be thereby secured thereto, and valves controlled by said key levers.

6. In a musical instrument of the class described, the combination of a key board, a fulcrum shaft on said board, a plurality of
40 piano key levers fulcrumed on said rod, each lever being a length of wire having its outer end flattened and disposed in a plane at right angles with said board, a key body for each lever comprising a fingering top and a plu-
45 rality of lugs extending therefrom having passageways therethrough for receiving the flattened end of the respective lever, and valves controlled by said key levers.

7. In a musical instrument of the class described, the combination of a piano key board,
50 a fulcrum rod on said board, a plurality of piano key levers fulcrumed on said rod, each lever being a length of wire flattened at its outer end and disposed in a plane at right
55 angles with said board, an integral key body for each lever comprising a fingering top and lugs extending downwardly therefrom, said lugs having passageways for receiving the flattened end of the lever, and valves controlled
60 by said key levers.

8. In a musical instrument of the class described, the combination of a piano key-
board, a row of key levers fulcrumed intermediate their ends on said board, a fingering
65 plate for each lever having a row of apertured

lugs depending therefrom and the front end of the lever extending through said lugs to reinforce and support the fingering plate, and valves supported by the other ends of
said levers.

9. In a musical instrument of the class de-
scribed, the combination of a piano keyboard,
70 a row of piano key levers fulcrumed intermediate their ends on said board, fingering plates for said levers having depending aper-
75 tured lugs, said levers at their front ends being of polygonal cross section and extending through the lugs of the respective fingering plates to reinforce and support the plates, and
80 valves engaged by the rear ends of said levers.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

MARIO SOPRANI.

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