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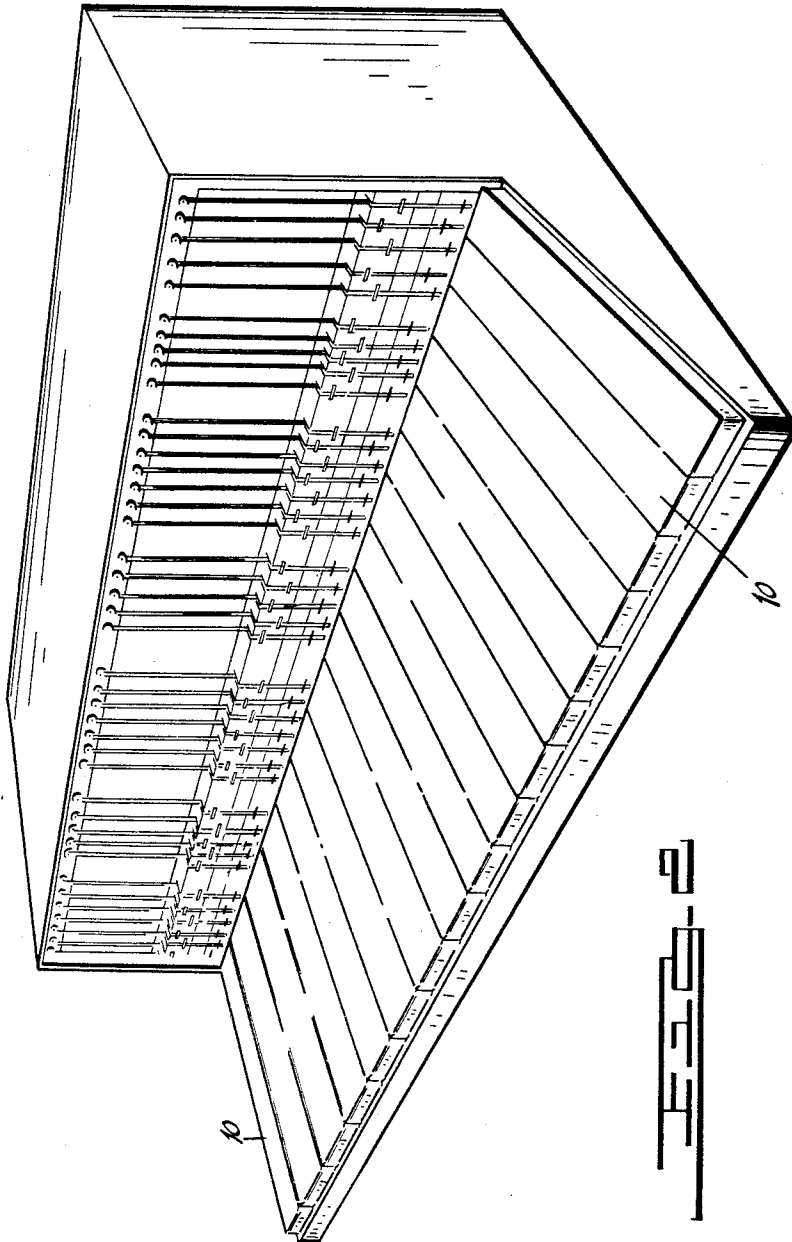
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2,932,232

ACCORDION OPERATING UPON AN ELECTRICAL MUSICAL INSTRUMENT

Filed Aug. 17, 1953

5 Sheets-Sheet 2



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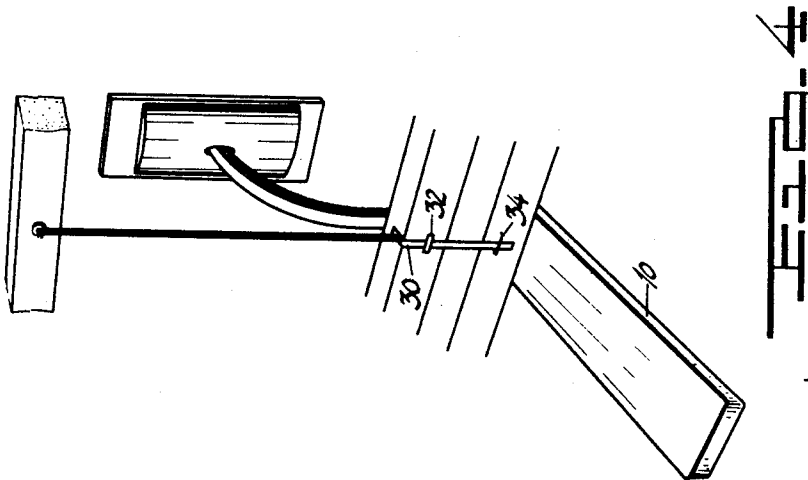
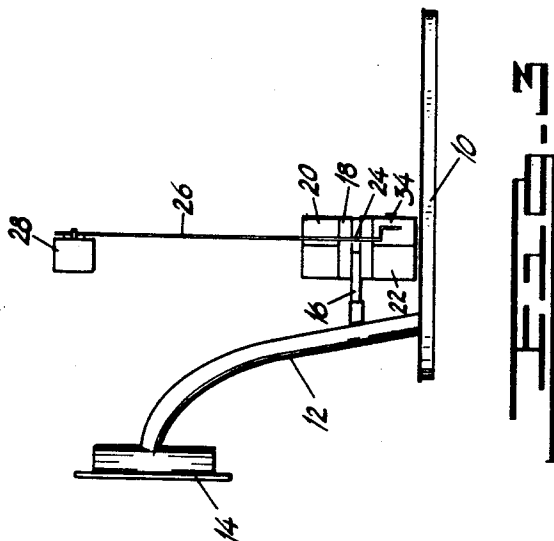


Fig. 2

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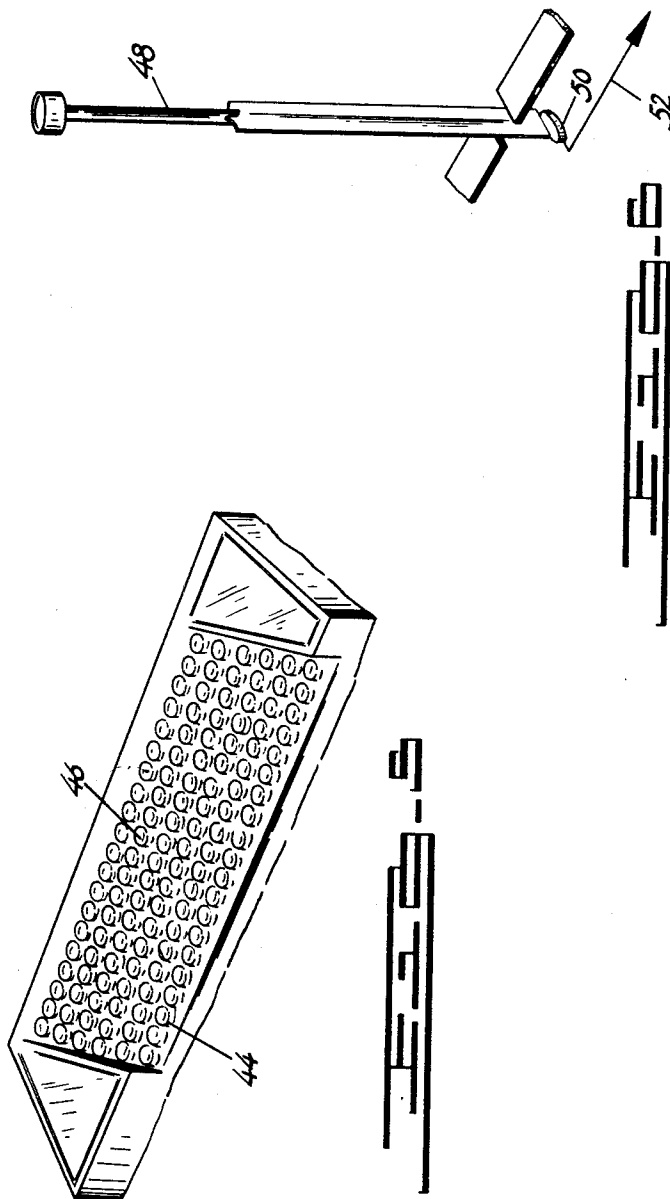
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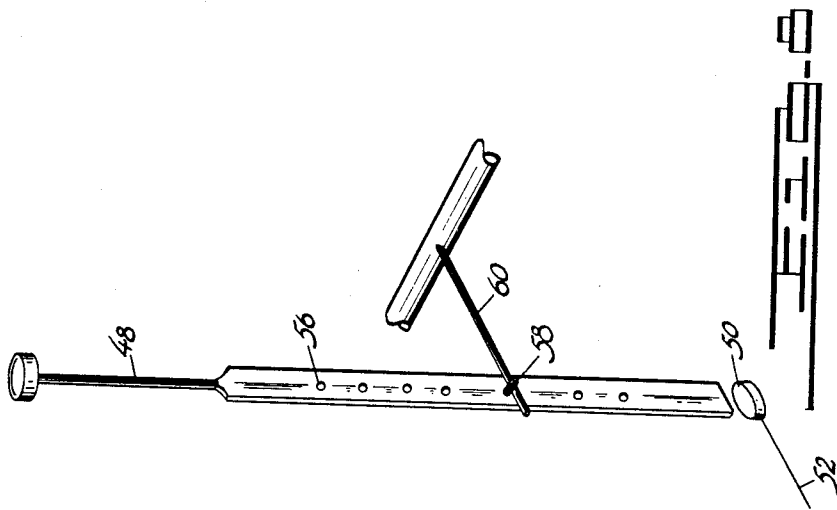
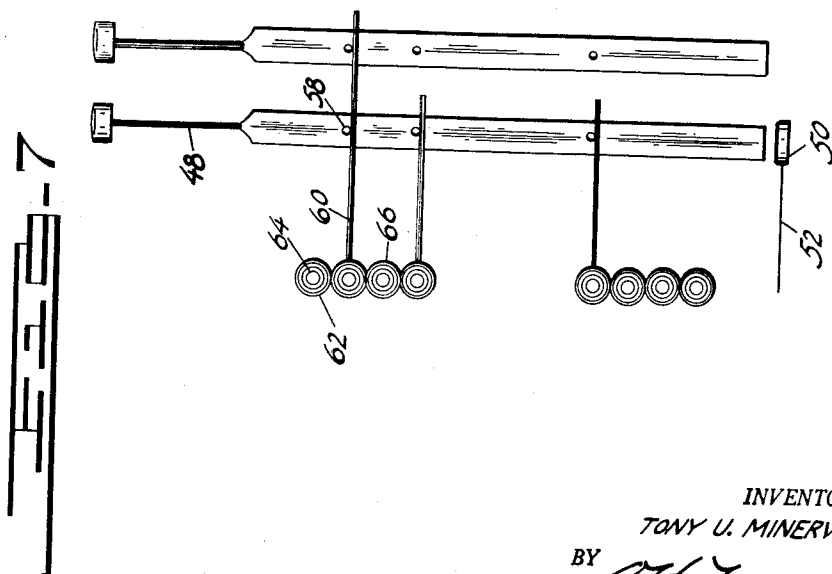
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ACCORDION OPERATING UPON AN ELECTRICAL MUSICAL INSTRUMENT

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5 Sheets-Sheet 5



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2,932,232

ACCORDION OPERATING UPON AN ELECTRICAL MUSICAL INSTRUMENT

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Application August 17, 1953, Serial No. 374,526

3 Claims. (Cl. 84-171)

This invention relates to accordions and more particularly to an accordion for producing sound effects different from and more strikingly beautiful than the music attained by other accordions.

It is generally conceded that accordions are one of the most popular of musical instruments. They are able to provide a wide variety of sound effects which make them desirable both as a solo and as an ensemble instrument. This invention provides an electro-mechanical accordion which makes the accordion an even more desirable instrument by producing tonal effects different from those previously attained by the accordions now in use. The accordion produces amplified tonal effects upon the actuation of first keys, unamplified tonal effects upon the actuation of second keys and a combination of amplified and unamplified tonal effects upon the actuation of third keys. The amplified tonal effects for certain keys are produced by an electronic amplifier.

An object of this invention is to provide an electro-mechanical accordion for producing tonal effects different from and more beautiful than those produced by accordions now in use.

Another object is to provide an accordion of the above character which utilizes an electronic amplifier to produce an amplification of the tonal signals representative of first keys upon an actuation of the keys.

A further object is to provide an accordion of the above character for producing amplified tonal signals representative of second keys upon an actuation of the keys and for simultaneously producing unamplified tonal signals in harmony with the amplified tonal signals.

Still another object is to provide an accordion of the above character for producing unamplified tonal signals representative of third keys upon an actuation of the keys.

A still further object is to provide an accordion of the above character which operates reliably and simply to produce such new tonal effects.

Other objects and advantages will be apparent from a detailed description of the invention and from the appended drawings and claims.

In the drawings:

Figure 1 is a plan view of the components associated with first and second pluralities of keys and also shows electrical circuits, partly in block form, for producing amplified tonal signals upon the actuation of the keys;

Figure 2 is an enlarged perspective view of the first plurality of keys and the components associated with the keys, such components also being shown in Figure 1;

Figure 3 is an enlarged perspective view of one of the keys shown in Figure 2 and the components associated with the keys;

Figure 4 is an enlarged perspective view of the key and components shown in Figure 3 as seen from a different angle than that shown in Figure 3;

Figure 5 is a perspective view of a keyboard which includes the second plurality of keys as well as a third

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plurality of keys different from the keys in the first and second pluralities;

Figure 6 is an enlarged perspective view of one of the keys in the second plurality and of the components associated with the key;

Figure 7 is an enlarged plan view of the key and components shown in Figure 6 and components associated with the key for simultaneously and automatically actuating certain keys in the third plurality upon the actuation of the key shown in the figure; and

Figure 8 is an enlarged perspective view of the key and certain of the components shown in Figure 7.

In one embodiment of the invention, a plurality of rectangular keys 10 are illustrated in Figure 2. Each of the keys 10 is connected to one end of a flexible coupling 12, (Figure 3), the other end of which is connected to a support member 14. An actuating rod 16 extends from each coupling 12 through a horizontal channel 18 defined by a pair of spaced support beams 20 and 22. Each actuating rod 16 has a vertical slot 24 which supports the free end of a leaf spring 26.

The leaf spring 26 is suitably secured at its upper end to a cross beam 28 and is disposed at an intermediate position within a slot 30 (Figure 4) in the support beam 20. The leaf spring 26 is suitably maintained within the slot 30 as by a bracket 32 which is fastened to the beam 20 on each side of the slot 30. At its lower end, the leaf spring 26 is slightly separated from an electrical contact 34 in the relaxed position of the spring and is adapted to touch the contact 34 upon a flexure of the spring.

A plurality of wires 38 (Figure 1) are provided, each in association with a different one of the contacts 34. The wires 38 extend from the contacts 34 to different terminals of an Organo indicated in block form in Figure 1 at 40. The output terminals from the Organo 40 are in turn connected to an amplifier 42 and the output from the amplifier 42 is applied to a loudspeaker 43. The Organo 40 including the amplifier 42 and the loudspeaker 43 are conventional components which may be purchased from the Lowry Corporation of Chicago, Illinois.

In addition to the rectangular keys 10 shown in Figure 2 and disclosed above, a number of annular keys are shown in Figure 5. These include a second plurality of keys 44 and a third plurality of keys 46. The keys 44 and 46 are located in a group separated from the keys 10. Each of the keys 44 is connected to a rod 48 which has a conductive portion at its bottom end. In the unactuated position of the keys 44, each of the rods 48 is separated from an associated contact 50. Wires 52 extend from the contacts 50 to the Organo 40 (Figure 1) to produce amplified signals when one of the keys 44 is actuated.

A plurality of spaced holes 56 (Figure 8) are provided in each of the rods 48. Pins 58 fit into certain of the holes 56 in each rod 48 and project outwardly to contact the free ends of arms 60. Each arm 60 is connected at its free end to a different one of the keys 46 for pivotal movement upon an actuation of the key. At its other end, each arm 60 is connected to a hollow tube 62 which encloses a shaft 64. Opposite ends of a spiral spring 66 are supported by the tube 62 and the enclosed shaft 64 so as to become constrained upon a rotary movement of the tube.

When one of the keys 10 is actuated, its associated coupling 12 moves to the right in Figure 3 and produces a corresponding movement of the actuating rod 16 in the channel 18. Since the leaf spring 26 is disposed within the slot 24 in the rod 16, it follows the movement of the rod by pivoting on its position of support on the beam 28. The leaf spring is able to pivot in a counter

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clockwise direction in Figure 3 because of its freedom of movement within the slot 30 in the support beam 20.

Upon a pivotal movement of the leaf spring 26 in a counter clockwise direction, the spring establishes electrical continuity with its associated contact 34. This causes the Organo 40 to produce tonal signals representative of the actuated key 10. The signals produced by the Organo 40 are amplified by the amplifier 42 and introduced to the loudspeaker 43 for broadcast.

Upon an actuation of one of the keys 46, the accordion constituting this invention produces tonal effects in a manner similar to that in conventional organs. These tonal effects are unamplified and are dependent upon the particular key that is actuated. When one of the keys 46 is actuated, it causes its associated arm 60 (Figure 7) to be pivoted. The arm 60 in turn produces a rotary movement of its associated tube 62 so that the spiral spring 66 within the tube becomes constrained. When the key 46 is released, the spiral spring 66 acts on the tube 62 and the arm 60 to produce a return of the key to its original position.

Just as the keys 10 produce an operation of the Organo 40 and the amplifier 42 when actuated, the keys 44 also produce an operation of the Organo and the amplifier. This results from the downward movement of the rod 43 to establish electrical continuity between the rod and its associated contact 50 when the key 44 is actuated. The downward movement of the rod 43 thus causes amplified tonal signals representative of the actuated key 44 to be introduced to the loudspeaker 43 for broadcast.

When the rod 43 moves downwardly, the pins 58 in the rod press downwardly upon certain of the arms 60 and cause certain of the keys 46 to be simultaneously actuated. The actuation of the keys 46 cause unamplified signals to be produced by the organ in harmony with the amplified tonal signals. In this way, chords of singular beauty can be easily produced.

There is thus provided an accordion which produces amplified tonal signals upon the actuation of first keys, unamplified tonal signals upon the actuation of second keys, and amplified tonal signals in harmony with unamplified tonal signals upon the actuation of third keys. In this way, the accordion is able to produce musical effects of singular beauty not previously attained by musical instruments now in use.

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Although this invention has been disclosed and illustrated with reference to particular applications, the principles involved are susceptible of numerous other applications which will be apparent to persons skilled in the art. The invention is, therefore, to be limited only as indicated by the scope of the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. An electro-mechanical instrument comprising a mechanical accordion having two groups of keys connected to normally operate valves to the several reed chambers for mechanically producing the corresponding accordion tones, an electrical organ having an amplifier and loudspeaker, and a set of contact switches for operating said organ to electrically produce corresponding organ tones, one group of said accordion keys having means for operating a corresponding group of said contact switches for simultaneously reproducing the corresponding organ tones, a portion of said other group of said accordion keys having similar means for reproducing corresponding organ tones and being mechanically connected to operate other keys for simultaneously also producing selected corresponding harmonious accordion tones, the remaining portion of said other keys operating only the mechanical valves to produce the corresponding accordion tones.

2. An electro-mechanical instrument as defined in claim 1, said two groups of keys comprising the higher clef keys for operation with one hand, and the base keys for operation with the other hand.

3. An electro-mechanical instrument as defined in claim 2, said one group having means for operating the organ switches comprising said higher clef group, said other group comprising said base group, a portion of which produce solo accordion base tones.

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