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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements relating to Musical Instruments

I, PETER SIMON PROLL of 246 Pomona Avenue, Newark in the State of New Jersey, United States of America, citizen of the United of the United States of America, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a keyboard assembly for a musical instrument, and more particularly, to such a keyboard assembly in which the keys, the stops, and the springs are integrally formed.

It is an object of the present invention to provide an integrally formed key, stop and spring assembly.

It is a further object of the present invention to provide a plurality of integrally formed interconnected keys, stops, and springs.

It is a further object of the invention to provide a keyboard assembly which does not require separate assembly of each of the components, but provides an entire keyboard assembly in a premoulded integral form, that may be literally dropped into place, whereupon the assembly is complete.

It is a further object of the invention to provide a keyboard assembly which is relatively inexpensive to manufacture and assemble, is durable and need not be adjusted.

These objects and advantages as well as other objects and advantages may be attained by the device shown in the drawings by way of illustration of the invention, in which:

Figure 1 is a perspective view of one species of key, stop and spring assembly;

Figure 2 is a perspective view of a second species of key, stop and spring assembly;

Figure 3 is a perspective view of a third species of key stop and spring assembly;

Figure 4 is a back perspective view of another species;

Figure 5 is a front perspective view of another species;

Figure 6 is a front perspective view of the keyboard assembly support; and

Figure 7 is a front perspective view of the assemblage of the keys, stops and springs on the support, with the cover in place and partly exploded away.

In the manufacture of inexpensive keyboard instruments wherein musical tones are produced by the unstopping of an air vent to permit the passage of air through a port so that a reed may sound, it has been the practice to form keys and stops separately, to provide a separate spring for the positioning of each stop, and individually to assemble each key and stop, and spring. In a musical instrument having a large number of keys, perhaps only eight or perhaps forty or more, the time consumed and the labour expense is very considerable. It has been found that the individual keys, as well as the stops, and the actuating springs for positioning the stops in normal position, can be moulded as a unit with one key, or for many keys. Assembly of the keyboard with its plurality of keys, stops, and springs merely means dropping the keyboard assembly into place on the keyboard, thereby effecting a very large economy of labour costs, handling charges and creating a device of great durability, free from the necessity of frequent repairs.

Referring now to the drawings in detail, a number of species of the invention are shown.

FIGURE 1 shows a key 11. The inner end of the key 11 is integrally attached to a pair of perpendicular stops 12, 13, and define an air control assembly. The stops 12, 13 have a space 14 between them. A spring 15 in the form of an elongated rectangular rod is attached to the key 11 and integrally formed therewith. Between the lower ends of the stops 12, 13, a web 16 unites the stops 12, 13 together and to spring 15. The top of the spring 15 is attached to a horizontal bar 17. Similar assemblies of keys 11, stops 12, 13, and springs 15, are also moulded side by side and are at-

[*Price 4s. 6d.*]

Price 25p

tached to the bar 17. A support 18 for the keyboard assembly 19 is provided. The support has a plurality of air holes 20, in its vertical portion which are arranged in pairs 20, 21. This arrangement of dual airholes is optional for use with the species of the invention shown in Figure 1, in which there are pairs of stops 12, 13. If the tone producing device is of dual character, one reed of which is aspiratory and the other is expiratory, the pairs of stops will unblock each pair of airholes, so that regardless whether the air is being expelled or sucked in, one or the other of the reeds will sound. Integrally formed with the support 18 is a horizontal portion or keyboard 22 with a plurality of sharp or flat keys 23 which are dummies (in the simplified form shown) and serve to position the keyboard assembly 19 by intruding the flat or sharp keys 23 between the keys 11, 11 etc. In a more advanced instrument, the sharp or flat keys 23 may be moulded as part of the keyboard assembly 19. A cover or grille 24 is attached to the support 18, and engages the bar 17 to hold it against support 18. By reason of this positioning of the bar 17, the springs 15 normally urge the stops 12, 13 into closing relationship with the airholes 20, 21. The keys 11 also are maintained in upwardly spaced relationship above the keyboard 22. When a key 11 is depressed the stops 12, 13 are pivoted outwardly from the support 18 to uncover the pairs of airholes 20, 21, thereby permitting air to pass through the holes, and permitting the reeds to sound.

It is apparent that the keyboard has been immediately assembled complete merely by dropping the keyboard 19 assembly as a unit into place on the keyboard 22, and attaching the grille 24. The material of which the keyboard assembly 19 is made may be metal although a moulded plastic material is preferred because of the ease and cheapness in moulding.

An important feature of the construction is the dimensionality. The key 11 and the stops 12, 13 are made of such a thickness of material that they will be relatively rigid with respect to each other. When the key 11 is depressed, the stop by reason of its thickness and rigid attachment to the key 11, will pivot in correspondence with the depressing of the key 11. Any plastic material having the requisite rigidity can be used. The integrally formed spring 15 must be deflectable. Therefore, the plastic material must be of a slightly resilient character and cannot be brittle. Here again the dimensionality is important. The spring member 15 is relatively long and thin, so that it may flex and be deformed sufficiently to permit the attached key 11 to move and to move the stops 12, 13 together as a unit. This spring 15 is resilient by reason of its thinness and length in comparison with the key 11 and stops 12, 13 so that it is able to restore the stops to normal closing position with respect to the holes 20, 21, after the key 11 is released.

It is not always necessary to use separate aspiratory and expiratory reeds. It is possible to use a single reed which resonates both as an aspiratory and as an expiratory reed. In this case, the species of the invention shown in Figure 2 may be utilized. It will be seen that in this species there is but a single stop 26 surrounded by a bifurcated spring 27, 28. In contrast, in Figure 1, it is the stop 12, 13 which is bifurcated. In Figure 3 another species of the air control assembly is shown. In this species the spring 29 is integrally formed with the stops 30 and is a thin arcuate loop, which engages the inside of the cover 24 and is slightly flattened when the key 31 is depressed, to urge the stop 30 away from the airholes 20, 21.

In the species of the invention shown in Figure 4, the springs 32, 32 are formed on the bottom of the keys 11, 11 and are united together by the bar 17. Stops 12 are attached to the keys 11.

In the species shown in Figure 5, the springs 33 are integrally formed with the top of the stops 34 on the keys 11. Each spring 33 is attached at its upper end to the bar 17.

Although the invention has been presented primarily as an aspect of a mass production low priced keyboard assembly for a musical instrument, it may be adapted for serious and costly musical instruments of the keyboard type wherein not only air is to be controlled by the uncovering of stops, but also electro-switches are actuated, and as well for higher type musical instruments in which air control is the sole sound producing factor. The preferred plastic material having suitable rigidity is polystyrene, or many of the vinyl resins, cellulose acetate and there are numerous others.

The foregoing specification illustrates a few embodiments of the invention. Many changes may be made in the selection, construction and arrangement of the parts, without departing from the scope of the invention, as defined in the appended claims.

WHAT I CLAIM IS:—

1. A keyboard assembly for a musical instrument comprising a key, an integral stop on the key, a support for the stop having an airhole, the key and stop defining a pivotable air-control assembly being arranged together on the support with the stop against the airhole, a spring attached to and integral with the air-control assembly and normally urging the stop against the airhole, the air-control assembly being dimensioned as to the length of its members and the thickness of the material from which it is made to be relatively rigid, but the spring being dimensioned as to its length, and the thinness of the material of which it is made to be relatively resilient.

2. A keyboard assembly for a musical instru-

tached to the bar 17. A support 18 for the keyboard assembly 19 is provided. The support has a plurality of air holes 20, in its vertical portion which are arranged in pairs 20, 21. This arrangement of dual airholes is optional for use with the species of the invention shown in Figure 1, in which there are pairs of stops 12, 13. If the tone producing device is of dual character, one reed of which is aspiratory and the other is expiratory, the pairs of stops will unblock each pair of airholes, so that regardless whether the air is being expelled or sucked in, one or the other of the reeds will sound. Integrally formed with the support 18 is a horizontal portion or keyboard 22 with a plurality of sharp or flat keys 23 which are dummies (in the simplified form shown) and serve to position the keyboard assembly 19 by intruding the flat or sharp keys 23 between the keys 11, 11 etc. In a more advanced instrument, the sharp or flat keys 23 may be moulded as part of the keyboard assembly 19. A cover or grille 24 is attached to the support 18, and engages the bar 17 to hold it against support 18. By reason of this positioning of the bar 17, the springs 15 normally urge the stops 12, 13 into closing relationship with the airholes 20, 21. The keys 11 also are maintained in upwardly spaced relationship above the keyboard 22. When a key 11 is depressed the stops 12, 13 are pivoted outwardly from the support 18 to uncover the pairs of airholes 20, 21, thereby permitting air to pass through the holes, and permitting the reeds to sound.

It is apparent that the keyboard has been immediately assembled complete merely by dropping the keyboard 19 assembly as a unit into place on the keyboard 22, and attaching the grille 24. The material of which the keyboard assembly 19 is made may be metal although a moulded plastic material is preferred because of the ease and cheapness in moulding.

An important feature of the construction is the dimensionality. The key 11 and the stops 12, 13 are made of such a thickness of material that they will be relatively rigid with respect to each other. When the key 11 is depressed, the stop by reason of its thickness and rigid attachment to the key 11, will pivot in correspondence with the depressing of the key 11. Any plastic material having the requisite rigidity can be used. The integrally formed spring 15 must be deflectable. Therefore, the plastic material must be of a slightly resilient character and cannot be brittle. Here again the dimensionality is important. The spring member 15 is relatively long and thin, so that it may flex and be deformed sufficiently to permit the attached key 11 to move and to move the stops 12, 13 together as a unit. This spring 15 is resilient by reason of its thinness and length in comparison with the key 11 and stops 12, 13 so that it is able to restore the stops to normal closing position with respect to the holes 20, 21, after the key 11 is released.

It is not always necessary to use separate aspiratory and expiratory reeds. It is possible to use a single reed which resonates both as an aspiratory and as an expiratory reed. In this case, the species of the invention shown in Figure 2 may be utilized. It will be seen that in this species there is but a single stop 26 surrounded by a bifurcated spring 27, 28. In contrast, in Figure 1, it is the stop 12, 13 which is bifurcated. In Figure 3 another species of the air control assembly is shown. In this species the spring 29 is integrally formed with the stops 30 and is a thin arcuate loop, which engages the inside of the cover 24 and is slightly flattened when the key 31 is depressed, to urge the stop 30 away from the airholes 20, 21.

In the species of the invention shown in Figure 4, the springs 32, 32 are formed on the bottom of the keys 11, 11 and are united together by the bar 17. Stops 12 are attached to the keys 11.

In the species shown in Figure 5, the springs 33 are integrally formed with the top of the stops 34 on the keys 11. Each spring 33 is attached at its upper end to the bar 17.

Although the invention has been presented primarily as an aspect of a mass production low priced keyboard assembly for a musical instrument, it may be adapted for serious and costly musical instruments of the keyboard type wherein not only air is to be controlled by the uncovering of stops, but also electro-switches are actuated, and as well for higher type musical instruments in which air control is the sole sound producing factor. The preferred plastic material having suitable rigidity is polystyrene, or many of the vinyl resins, cellulose acetate and there are numerous others.

The foregoing specification illustrates a few embodiments of the invention. Many changes may be made in the selection, construction and arrangement of the parts, without departing from the scope of the invention, as defined in the appended claims.

WHAT I CLAIM IS:—

1. A keyboard assembly for a musical instrument comprising a key, an integral stop on the key, a support for the stop having an airhole, the key and stop defining a pivotable air-control assembly being arranged together on the support with the stop against the airhole, a spring attached to and integral with the air-control assembly and normally urging the stop against the airhole, the air-control assembly being dimensioned as to the length of its members and the thickness of the material from which it is made to be relatively rigid, but the spring being dimensioned as to its length, and the thinness of the material of which it is made to be relatively resilient.

2. A keyboard assembly for a musical instru-

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ment comprising a plurality of keys, an integral stop on each key, a support for the stops having a plurality of airholes, the keys and stops defining pivotable air-control assemblies, being arranged together on the support with each stop against a corresponding airhole, a spring attached to and integral with each air-control assembly and normally urging the stop against the airhole, each spring being connected to the adjacent spring, the air control assembly being dimensioned as to the length of its members and thickness of the material from which it is made, to be relatively rigid, but the spring being dimensioned as to its length and the thinness of the material of which it is made to be relatively resilient.

3. A keyboard assembly according to Claim 1, the spring originating from the air-control assembly at the juncture of the key and stop.

4. A keyboard assembly according to claim 2, each spring originating from the air-control assembly at the juncture of its corresponding key and stop.

5. A keyboard assembly according to claim 1, the spring being arcuate and originating from the end of the stop.

6. A keyboard assembly according to claim 2, each spring being arcuate and originating from the end of each stop and being integrally attached to each adjacent spring.

7. A keyboard assembly according to claim 1, the spring originating from the bottom of the key.

8. A keyboard assembly according to claim 2, each spring originating from the bottom of each corresponding key.

9. A keyboard assembly according to claim 1, the spring originating from the top of the corresponding stop.

10. A keyboard assembly according to claim 1, each spring originating from the top of each corresponding stop.

11. A keyboard assembly according to claim 1, the stop being bifurcated.

12. A keyboard assembly according to claim 2, each stop being bifurcated.

13. A keyboard assembly according to claim 1, the spring being bifurcated.

14. A keyboard assembly according to claim 2, each spring being bifurcated.

15. A keyboard assembly according to claim 1, and comprising a cover attached to the support and enclosing the stop, an end of the spring being seized between the cover and support.

16. A keyboard assembly according to claim 1, and comprising a cover attached to the support and enclosing the stops, an end of each spring being seized between the cover and the support.

17. A keyboard assembly for a musical instrument substantially as herein described and shown in Figures 1, 6 and 7 of the accompanying drawings, or with the modifications shown in any of Figures 2 to 5 of the drawings.

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