

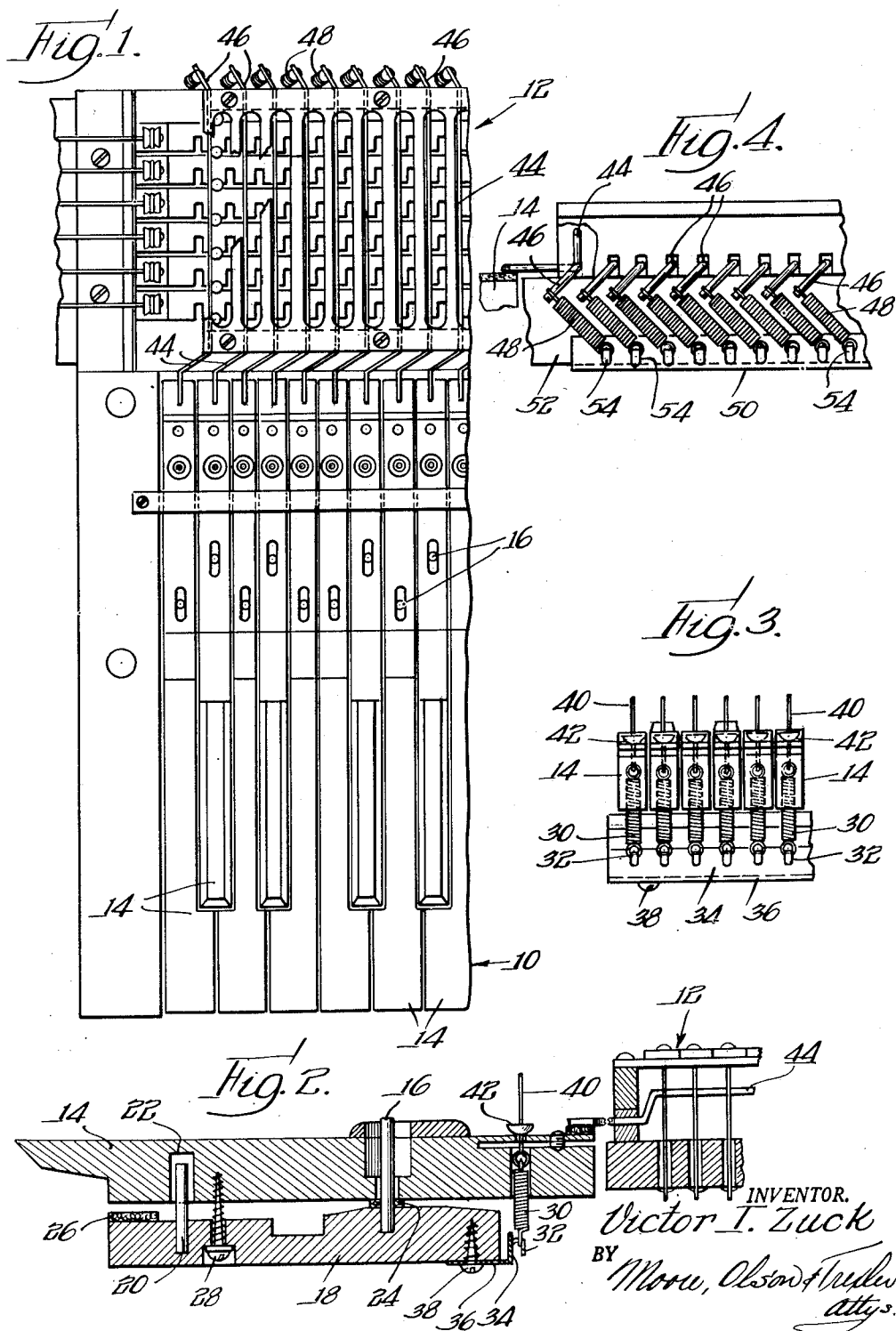
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MULTIPLE SPRING ANCHOR

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MULTIPLE SPRING ANCHOR

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This invention relates to musical instruments, and particularly to means for anchoring the springs which are employed to restore movable members such as keys and rocker arms in an organ or other keyboard type of instrument.

Heretofore it has been customary to anchor the aforesaid springs by screws, nails, hooks or like devices which are mounted individually on stationary parts of the instrument. The procedure of mounting such individual anchoring devices is slow, laborious, expensive and frequently does not afford accurate location of the anchoring devices. Moreover, replacement of anchoring devices which are defective or have worked loose adds to the task of maintenance.

An object of the present invention is to overcome the foregoing difficulties by replacing a plurality of individual anchoring devices with a unitary strip or other member carrying a plurality of spring-anchor projections suitably sized and spaced, this strip being adapted for attachment to the instrument by a relatively small number of fastening devices. The invention contemplates utilization of such anchoring means in all instances where a plurality of aligned rockable members such as keys or rocker arms is equipped with restoring springs arranged in a row, thereby greatly facilitating the operation of anchoring these springs.

Various other objects, advantages and features of the invention will be apparent from the following specification when taken in connection with the accompanying drawing wherein certain preferred embodiments are set forth for purposes of illustration.

In the drawing, wherein like reference numerals refer to like parts throughout:

Fig. 1 is a fragmentary plan view of a keyboard and associated coupler assembly in an electric organ;

Fig. 2 is a view, in vertical section, of a key in association with a multiple spring anchor constructed in accordance with and embodying the principles of the invention;

Fig. 3 is a fragmentary view, in rear elevation, of the keyboard and spring anchor; and

Fig. 4 is a fragmentary rear elevation of the coupler assembly, illustrating another application of the invention.

Referring now to Fig. 1, there is illustrated a portion of the keyboard 10 and coupler assembly 12 of an electric organ in which the present invention may be utilized to advantage. The individual keys 14, Fig. 2, are pivoted on rocker pins 16 extending from a baseboard 18. Guide

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pins 20 extending up from the baseboard 18 are received in openings 22 in the key 14. The fulcrum of the key 14 is afforded by a felt washer 24 disposed on the rocker pin 16 between the key 14 and the baseboard 18. A felt strip 26 on the baseboard 18 limits downward motion of the forward end of key 14. A stop screw 28, which extends through a suitable opening in the baseboard 18 and is threaded into the underside of key 14, limits upward motion of the forward end of this key under the influence of a contractile coil spring 30 that exerts a continuous downward force on the rear end of key 14. An individual coil spring 30 is provided for each key 14 to restore the key into the position thereof shown in Fig. 2 after the key has been depressed and released.

In accordance with the present invention the lower end of each coil spring 30 is anchored to a lug or projection in the form of a hook 32 which is struck outwardly from a flange 34 on a strip or anchor member 36, Figs. 2 and 3. The strip 36 is of suitable material such as steel and is attached to the baseboard 18 by fastening devices such as screws 38. The upper ends of the springs 30 are attached to screw eyes 40, the shanks of which extend vertically through clearance openings in the keys 14 and are threaded through adjusting nuts 42, preferably of semi-hard rubber or plastic of similar cushioning properties, each of which bears on the upper surface of key 14 at the rear end thereof. The nuts 42 enable the tension of springs 30 to be adjusted as desired.

The provision of integral anchor lugs or hooks 32 carried by the strip 36 insures proper relative spacing of the hooks 32 and eliminates the time-consuming operation of installing numerous individual anchoring devices on the baseboard 18 or other stationary part of the organ structure. The strip 36 is conveniently formed by a die and is readily mounted in its position of use. Furthermore, the hooks 32 are strong enough so that they do not break off or work loose while the spring anchor strip is in service. Obviously, the invention is not limited to hooks as 32 struck out from the anchor member 36 inasmuch as substantially the same result could be achieved, for example, by hooking the lower ends of the springs 30 in apertures or serrations in the member 36.

In the particular organ structure illustrated in Fig. 1, each key 14 is adapted to actuate an individual rocker arm 44 when depressed, such rocker arm 44 being included in the coupler assembly 12. Such actuation of the rocker arms 44 is effective to close certain electrical circuits joint-

ly controlled by the keys and stop tablets of the organ. Each rocker arm 44 includes a crank 45 (Figs. 1 and 4) to which is secured one end of a coil spring 48 for restoring the rocker arm 44 when the associated key 14 is released.

For each row of coil springs 48 there is provided a strip or anchor member 50, Fig. 4, constituting a second embodiment of the invention, which is attached to a stationary part of the organ structure such as a baseboard 52. Spring anchors 54, which may be formed in the manner of spring anchors 32, Fig. 2, are carried by the strip 50 for securing the lower ends of the coil springs 48. In the present instance, since the springs 48 are included in electrical circuits extended through the coupler assembly 12, the strip 50 constitutes an electrical conductor in addition to serving as an anchor member. Preferably the strip 50 is of brass, and the springs 48 are soldered to the lugs or hooks 54 and to the cranks 46 of the rocker arms 44. For rapid assembly, soldering may be dispensed with an electrical contact assured by bending the anchoring lugs 54 into their respective apertures in the strip 50, this arrangement also affording good mechanical connection.

The invention has been disclosed as being utilized in two different instances in an electric organ. Additional uses of the invention in organs or other musical instruments will be apparent to those skilled in the art. Therefore, I do not desire that the invention be limited to the precise embodiments shown, but intend that it include all modifications and changes coming within the true spirit and scope thereof as set forth in the appended claims.

The invention is hereby claimed as follows:

1. In an electric organ, a plurality of manually operable keys mounted for individual pivotal movement, a frame structure, an anchor strip fixed to the frame, said anchor strip having spaced anchorage means thereon, a plurality of springs respectively connected between the strip anchorage means and said keys, means for individually adjusting the tension of each spring, a plurality of switch rockers connected respectively for actuation by the keys, a second anchor strip secured to the frame, said second anchor strip being provided with spaced anchorage means thereon, and a plurality of springs respectively connected by soldered connections between the switch rockers and the anchorage means of said second strip.

2. In a musical instrument having a frame and an aligned row of members mounted for individual rocking movement on the frame responsive to manual actuation, means for restoring said members to and for normally holding said members in predetermined position comprising a row of springs respectively connected at one end to said members, said springs each having at their other ends a connecting loop formed as an integral part of the spring, an elongated anchor strip, and means for mounting the strip on the instrument frame, said strip having a row of spaced hook projections formed thereon to which the spring loops are respectively connected, each of said hook projections having its free hook end extending away from its connected spring, whereby the spring loop may be freely moved onto and off from the hook to connect and disconnect the spring from the anchor strip.

3. A musical instrument structure as defined in claim 2, wherein said anchor strip is formed of sheet metal, and wherein the hook projections thereof are struck out from the body of the strip.

4. A musical instrument structure as defined in claim 2, wherein each of said springs comprises a coil spring each having connecting loops formed at the opposite ends thereof.

5. A musical instrument structure as defined in claim 2, wherein the rocking members comprise instrument playing keys, and wherein the connections between each spring and key includes adjustment means for varying the tension of the spring to thereby control the manual actuating pressure to effect the movement of the key.

6. A musical instrument structure as defined in claim 2, wherein said rocking members comprise instrument playing keys each mounted upon the instrument frame for manual actuation within a given plane, and wherein the spring connected to each key lies within such plane and parallel thereto.

7. A musical instrument structure as defined in claim 2, wherein the musical instrument comprises an electric organ, and wherein said rocking members comprise rocker arms for electrically actuating tone control switches, the springs forming an electrical connection between the rocker arms and said anchor strip.

8. A musical instrument structure as defined in claim 7, wherein the springs are soldered to the hook projections for insured electric circuit connection.

9. A musical instrument structure as defined in claim 2, wherein the musical instrument comprises an electric organ, and wherein said rocking members comprise rocker arms for electrically actuating tone control switches, the springs being angularly disposed with respect to the longitudinal axis of the anchor strip.

10. In an electric organ, a plurality of manually operable keys mounted for individual pivotal movement, a frame structure, an anchor strip fixed to the frame, said anchor strip having spaced anchorage means thereon, a plurality of springs respectively connected between the strip anchorage means and said keys, means for individually adjusting the tension of each spring, a plurality of switch rockers connected respectively for actuation by the keys, a second anchor strip secured to the frame, said second anchor strip being provided with spaced anchorage means thereon, and a plurality of springs respectively connected between the switch rockers and the anchorage means of said second strip.

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