United States Patent [19]

Holder, Jr.

[11] **3,746,820**

[45] **July 17, 1973**

[54] **PRESSURE BOARD FOR THE ELECTRICAL CONTACTS FOR AN ELECTRIC ORGAN**

[76] Inventor: **David A. Holder, Jr.**, 8303 Donoghue Dr., New Carrollton, Md. 20784

[22] Filed: **Feb. 22, 1972**

[21] Appl. No.: **228,092**

[52] **U.S. Cl.** ..... **200/170 A**, 200/166 J, 84/423, 84/433, 84/DIG. 7

[51] **Int. Cl.** **H01h 1/50**, G10c 3/12

[58] **Field of Search** ..... 84/1.01, 1.09, 1.1, 84/1.12, 1.15, 1.26, 1.27, DIG. 7, 423, 433-436; 200/166 H, 166 J, 170 A, 170 R

[56] **References Cited**

UNITED STATES PATENTS

3,657,459	4/1972	Peterson et al.	84/1.01
3,657,460	4/1972	Cutler	84/1.01

Primary Examiner—Richard B. Wilkinson
Assistant Examiner—Stanley J. Witkowski
Attorney—Frank P. Cyr

[57] **ABSTRACT**

A pressure board which extends over a plurality of flexible contact members so as to apply a positive pressure at the apex of the contact members to insure a firm contact point for the electrical contacts of a keyboard of an electric organ when the organ keys are depressed.

4 Claims, 4 Drawing Figures

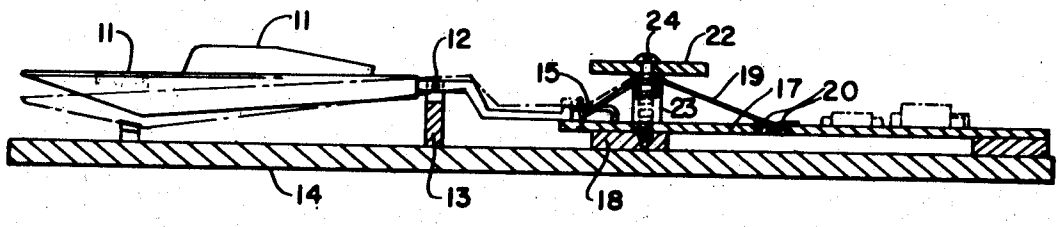


FIG. 1.

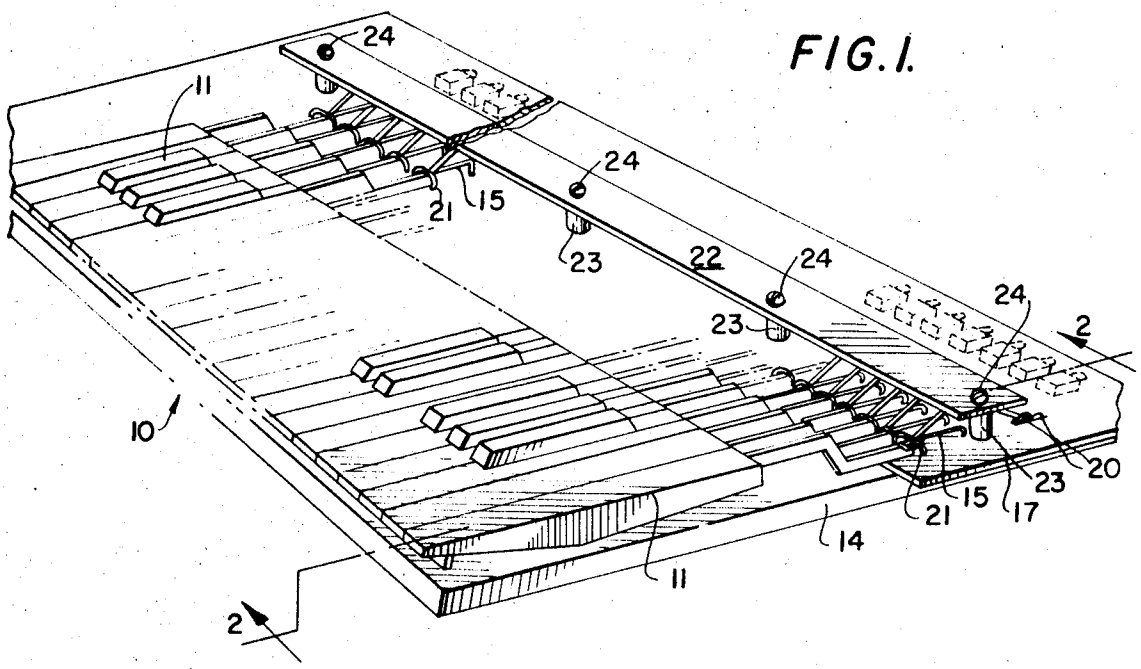


FIG. 2.

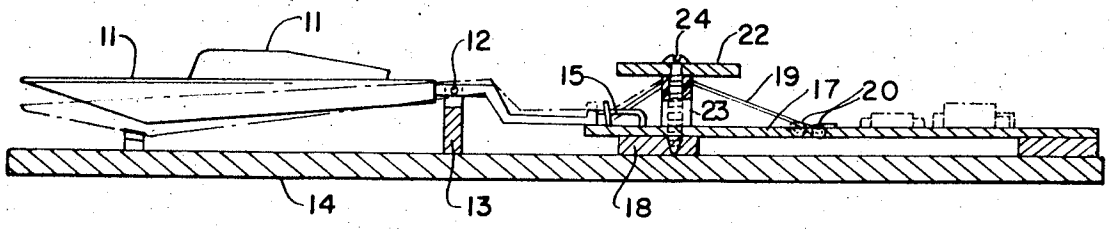


FIG. 3.

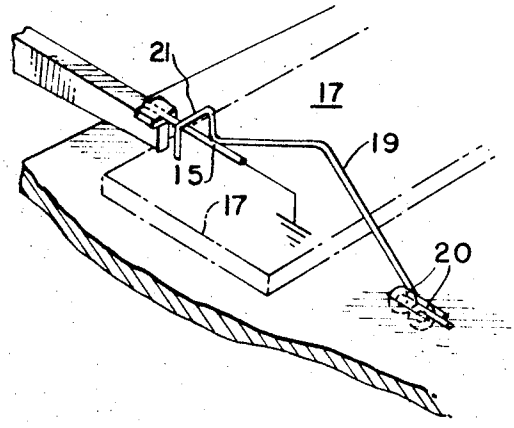
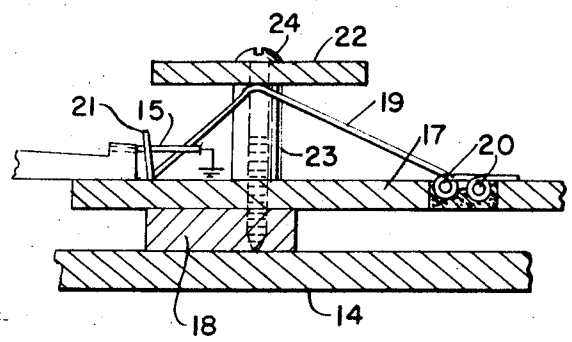


FIG. 4.



PRESSURE BOARD FOR THE ELECTRICAL CONTACTS FOR AN ELECTRIC ORGAN

BACKGROUND OF THE INVENTION

The keyboard of an electric organ usually comprises a plurality of playing keys which are pivotally mounted in any suitable manner on to a suitable supporting surface and when the keys are depressed, one end of the key is caused to move upwardly. Mounted in any suitable manner to the end of the pivoted key is an electrical contact means which is normally out of contact with it's associated contact piece but which is caused to complete the electrical circuitry between the said contact pieces when the key is depressed. As can be appreciated, the constant depression of the keys will cause the contact members, which usually comprise spring-like members, to eventually lose some of it's spring action with resultant poor contact between the contact points. When this occurs, a poor transmission of electrical power results and this will be reflected by a tone of inferior quality emenating from the organ. Quite frequently an electric organ has to be serviced so as to restore the tone qualities emenating therefrom. Often, the trouble lies in the fact that upon the depression of a key a poor electrical contact is made between the contact points with resultant tone of inferior quality. Usually to restore the organ for the transmission of tones of the desired quality, one has to service the contact points to make certain that a good contact is made between these parts. Such service may be in the nature of cleaning of the contact points as one would for any ordinary circuit breaker so as to restore a proper making and breaking of the electrical contacts.

The present invention obviates the need for the frequent servicing of the contact points for the reasons aforesaid, by providing a means whereby a constant pressure is applied to one member of the contact pieces so that when a player key is depressed a positive and good contact is effected between the contact points with resultant emission of a tone of the desired quality from the organ.

The main object of the invention is to provide a pressure plate or board which is positioned over the spring like fingers which form one part of the circuit makers and breakers so that when a key of the keyboard is depressed a firm contact will be made between the points of contact of the circuit makers and breakers, thus insuring the transmission of the proper electrical current through the switch to effect the production of a tone of the desired qualities.

Another object of the invention is to provide a means whereby the pressure plate or board may be readily adjusted on the base of the organ thereby insuring the application of the desired pressure on the spring fingers of the switch mechanism.

With the above and the objects in view my invention con-sists in the combination, arrangement and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a keyboard embodying the present invention, with parts broken away.

FIG. 2 is a section taken on line 2—2 of FIG. 1, looking in the direction of the arrows.

FIG. 3 is an enlarged sectional view with parts broken away disclosing one of the spring members forming a portion of the circuit maker and breaker, and,

FIG. 4 is an enlarged sectional side view showing the pressure board or plate applied over the spring member.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, like reference characters are employed to designate like parts throughout the several views. Reference numeral **10** indicates a conventional keyboard for an electric organ or the like. As is customary, the keyboard comprises a plurality of key members **11** pivotally mounted as at **12** on a suitable support **13** formed of any suitable material and anchored on to the base **14** in any known manner. Each key **11** is provided at the forward end thereof with a contact bar **15** which is in electrical connection with a source of electrical energy. As can be appreciated, the source of electrical energy is suitably mounted in a proper insulating base **17** which can be mounted in spaced relationship with the base **14** as by a spacer block **18** which extends the width of the base **14** and is secured thereto in any known manner.

Spring contact fingers **19** in the nature of an inverted V are provided, one for each of the keys **11.** The contact fingers can be wire like members bent to the aforesaid formation with one end thereof comprising loop members **20** which are rigidly mounted in the insulating base **17** and held in openings formed therein filled with a suitable resinous material which will harden and retain the same therein. Thus, as shown in the drawings, the loop end of the spring fingers is anchored in the insulating base with the opposite end thereof free and unattached to any surface as indicated by reference numeral **21** shown more particularly in FIG. **1** and **3** of the drawings. As shown in the drawings, the free end **21** of the spring finger is adapted to overlie contact bar **15** and suitable leads extend from the loop end of the fingers to an electrical circuitry well known in this art and need not be shown for a full understanding of the invention.

A pressure plate or board **22** formed of any suitable insulating material extends over each of the spring fingers and spacers **23** are disposed between the underface of the plate **22** and the top surface of insulating base **17.** Suitable screws **24** extend through the pressure plate **22** and spacers **23** for anchoring the same on to the insulating base **17.** The spacers **23** are shown as being formed of a unitary hollow stud or post. However, whenever desired, the spacers may be in the nature of a plurality of apertured discs formed of a suitable insulating material, and as can be appreciated the employment of discs to form the spacers will permit for the easy adjustment of the distance between the pressure plate **22** and insulating base **17.**

The structure described aforesaid will afford a means whereby a constant pressure can be applied downwardly on the spring fingers thus placing the same under a tension for a purpose to be described more fully hereinafter.

As can be appreciated, when the keys of the instrument are in their normal or undepressed condition the circuit between contact bar **15** and spring fingers **19** is open and it is only when a key is depressed as shown in dotted lines in FIG. **2** that the circuit between con-

tact bar **15** and the spring finger **19** associated therewith is closed. With the circuit closed for any one key, a sound is generated by the organ in a well known manner and the sound discontinued upon a return of the key to it's normal position.

As stated previously it is imperative that a good contact be established between the contact bar **15** and the spring finger **19** in order to insure a tone of desired qualities when a key is depressed. The structure of the instant invention permits for the application of a downward force on the spring fingers which will offer a resistance to upwards motion of the free end of the fingers when a key is depressed and the contact bar **15** caused to travel upwardly against the resistance imparted by the downwardly biased free end of the finger. To regulate the amount of pressure imposed on the apex of the spring finger, one need only to change the height of the spacers by the removal and replacement of the spacers with one of increased or diminished heights. Or, in the case where the spacers comprise apertured discs, the number of discs employed can be varied to meet the desired height for the spacers. The constant up and down motion of the free end of the spring will in time result in the loss to some extent of some of the spring action of the fingers and when this occurs one need only to apply more downward forces on the apex of the spring fingers to restore their ability to continue to function in their intended manner.

The invention has been described in association with a keyboard for an electric organ. However, it is submitted that the same inventive thought can be applied to any electrical instrument be it musical or otherwise where it is desired to place one part of a two part electrical circuit maker and breaker under a tension so as to oppose a force applied thereagainst by the other part to the circuit maker or switch.

Modifications may be made in my invention without departing from the spirit of it. Having thus described my invention in certain exemplary embodiments what I claim as new and desire secure by Letters Patent is:

I claim:

1. A circuit maker and breaker for a depressible pivoted key of a key-board musical instrument, said circuit maker and breaker comprising a first contact piece mounted on one end of said pivoted key, and a flexible contact piece mounted on a support within said instrument with one end thereof secured to said support and the free end thereof contacted by said first contact piece carried by said depressible key when said key is depressed, said flexible contact piece comprising a wire element wherein one plane thereof is above the plane of the ends of said flexible contact piece, a bar extending over all of said flexible contact pieces and contacting the area thereof which is above the plane of the ends of said flexible contact piece, said bar exerting a downward pressure on said flexible contact piece to increase the contact forces between said fixed and flexible contact pieces.

2. The structure recited in claim **1** wherein an adjustable spacer means extends between said pressure plate and said insulating board.

3. The structure recited in claim **1** wherein the tension applied to said end of said first contact member is adjustable.

4. The structure recited in claim **2** wherein the spacer means comprises a plurality of apertured discs.

* * * * *