

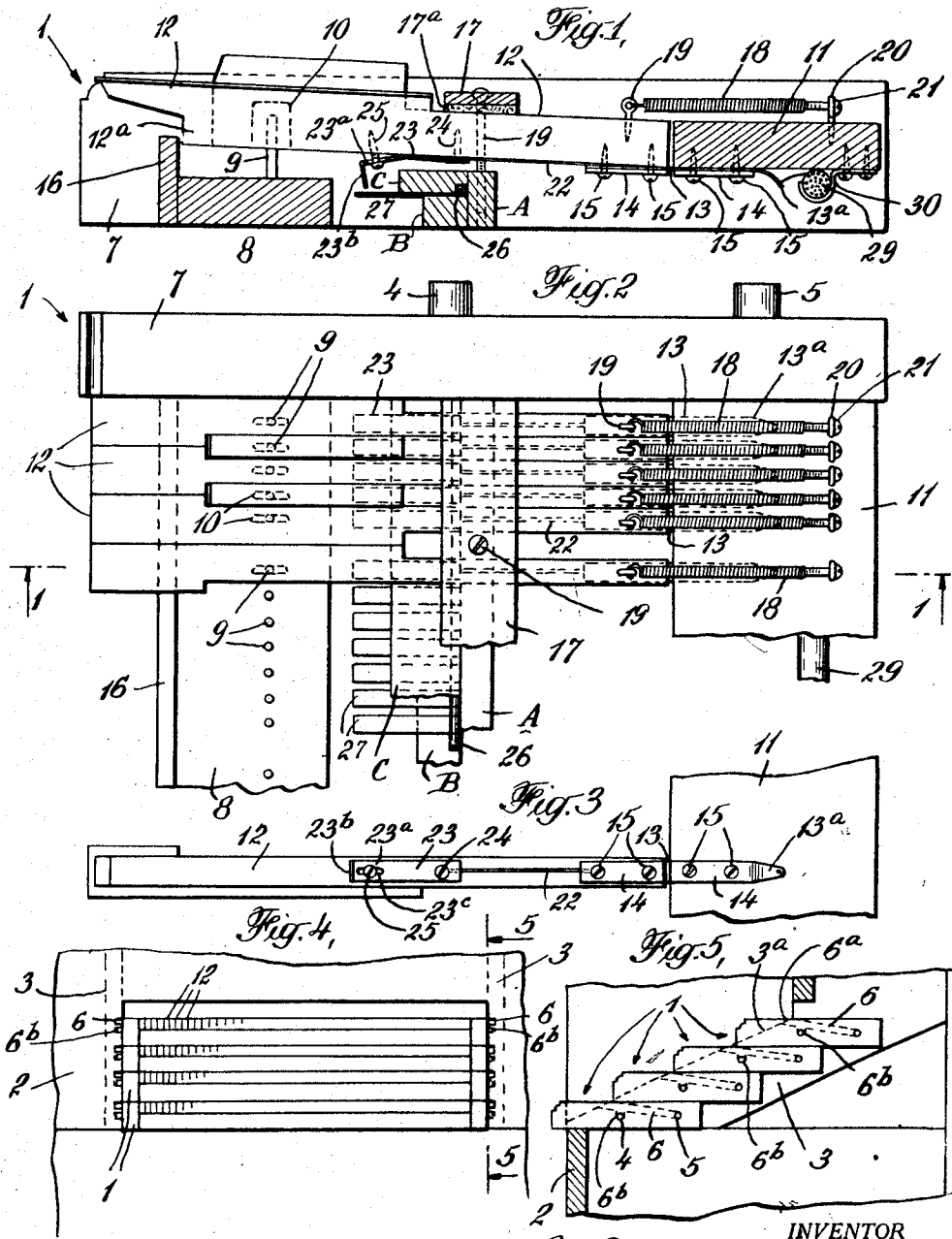
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KEYBOARD FOR ORGANS AND THE LIKE

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## UNITED STATES PATENT OFFICE.

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## KEYBOARD FOR ORGANS AND THE LIKE.

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My present invention relates to improvements in keyboards for organs and the like, whereby each manual, if there be more than one, is readily removable and replaceable independently of the other manuals for making the electrical connections or effecting changes and repairs; further, my invention comprises improvements in the means for operatively supporting the keys and in the electrical contacts operated by said keys and in the other matters of construction herein-after set forth.

The invention is independent of the number of manuals, whether one or more than one, but in the drawings (especially in Figs. 4 and 5) I have chosen to illustrate a four-manual keyboard.

In said drawings which illustrate the manual construction which at present I prefer within my invention, Fig. 1 is a fore and aft vertical section, partly in side elevation, through one of my improved manuals, said section being taken on the line 1—1 in Fig. 2; Fig. 2 is a fragmentary plan view of said manual at one end thereof, the remaining portion or end of the manual being a mere duplication of that shown, parts being broken away to reveal underlying structure; Fig. 3 is an underneath view of one of the keys thereof and related parts; Fig. 4 is a fragmentary front elevation of an organ or organ console embodying four of said manuals, this figure being on a reduced scale as compared with the previous figures; and Fig. 5 is a vertical section, partly in elevation, of the same four manuals, said section being taken on the line 5—5 in Fig. 4 looking in the direction of the arrows.

Each manual 1 is a unit supported on the organ or console 2 for ready removal; and if there be a plurality of manuals, each is readily removable independently of the others and as readily returned into its operative position. This independent removability feature permits ready access to each manual to make the electrical connections therewith or to change same, also to adjust the touch or playing tension of the keys or for any other desired purpose.

The means by which I support each manual for said independent ready removal and replacement comprises the following: 3—3 are a pair of spaced apart side frames located in vertical planes adjacent the respective ends of the manual or manuals and

forming fixed parts of the organ casing or console to support the manuals between them. In a plural manual organ, the manuals are arranged in the usual superposed overlapping fashion as shown in Fig. 5. Said side frames, and especially their front edges 3<sup>a</sup> incline from the front of the consol upwardly and rearwardly as shown in Fig. 5. Each manual has two pins 4 and 5 projecting outwardly from each end. 6—6 are grooves, two for each manual in the inner faces of the respective side frames 3 to receive slidably into them the pins 4 and 5 for each manual, first the rear pins 5 entering said grooves and then the front pins 4 during the insertion of the manual into its supported position. Said grooves incline slightly downwardly from their open front ends 6<sup>a</sup> which are located at the inclined front edges 3<sup>a</sup> of the side frames, to their closed rear ends.

Said closed rear ends engage the rear pins 5 of the manuals and form stops limiting the rearward movement of the given manual while inserting it into the grooves of the side frames as aforesaid. 6<sup>b</sup> designates notches extending downwardly from the underside of each groove 6 to receive into them the front pins 4 of the given manual after it has been slid fully into place and released. This drops the front end of the given manual so that its keys 12 become more nearly level as they should be for playing, and at the same time locks the manual so that it cannot become accidentally displaced. On the other hand, it is perfectly easy to remove one or more of the manuals by simply lifting it up at the front sufficiently to remove its front pins out of the said notches 6<sup>b</sup> and then pulling the given manual and its pins forwardly out of the grooves.

I will now describe the other novel structural features embodied in each manual, a description of one manual being sufficient for all since they are all alike. Thus, each manual comprises a frame consisting of two end strips or members 7—7 (extending on edge fore and aft of the consol, when the manual is in position) permanently united by cross rails (all of said end strips and rails being ordinarily made of wood), said rails being the following:

(1) A rail 8 located flatwise under the forward ends of the keys, this rail serving also to support the pins 9, one for each key, ex-

tending up freely into recesses 10 in the underside of the keys to guide their forward ends against lateral motion without interfering with their up and down motion, said  
5 recesses on this account being elongated lengthwise of the keys and being narrow crosswise thereof;

(2) A rail 11 located flatwise at the rear ends of the keys 12 and forming the support  
10 to which they are respectively hinged or attached for pivotal up and down movement by the flexible thin metal strips 13, one for each key located under the much thicker metal pieces 14 and secured by screws 15 to  
15 the underside of the rear ends of the keys, and to the underside of the rail 11;

(3) A rail 16 disposed on edge immediately in front of the rail 8 under the forward ends of the keys to extend up in front of  
20 the corners 12<sup>a</sup> of said keys, the purpose of this rail being merely to act as a finishing strip to hide the mechanism behind the rail and underneath the keys;

(4) A rail made up of the separate strips  
25 A, B and C, located under the middle portions of the keys and having functions as follows: Rail A serves as a support for another rail 17 extending horizontally over the keys to act as a buffer or stop rail preventing  
30 the keys from pivoting upwardly too far due to the pull thereon of the coiled tension springs 18. There is one of these springs for each key connecting a screw eye 19 on the rear end thereof to another screw  
35 eye 20 supported by the rear rail 11, the connection between said last named screw-eye and said spring being a screw 21 passed through said screw-eye up to the head of the screw, the threads of the screw engaging  
40 the coils of the spring so that by turning the screw with a screw-driver, the degree of tension of the spring 18 can be adjusted to regulate the "touch" or degree of pressure required to depress the given key. These  
45 springs 18 automatically return the keys to their up-position against the above described stop rail 17 which to eliminate noise is provided with a strip of felt 17<sup>a</sup> on its underside.

50 The means for supporting said stop rail from the rail A comprises vertical pins 19, whose lower ends have screw-threaded engagement with the rail A so that the height  
55 of the stop rail can be adjusted as desired.

The electrical contacts and wiring comprise the following: 29 is a cable of insulated wires, one wire for each key, said  
60 cable being supported by clips 30 underneath the rear rail, the respective wires of this cable being attached, preferably by soldering, to the rear ends 13<sup>a</sup> of the metal hinge strips 13.

22 is a wire electrically connecting the  
65 hinge-strip 13 of each key with member 23 consisting of a piece of thin springy metal,

one for each key on the underside thereof, bent into the shape shown in the side view in Fig. 1 and in the underneath plan view in Fig. 3. In other words, each of said  
70 members consists of a rear portion 23 secured against the underside of its key by a screw 24 and of a forward portion 23<sup>a</sup> bent downwardly from the underside of the key, the free end 23<sup>b</sup> of said forward portion being bent vertically downward. The portion 23<sup>a</sup>  
75 is longitudinally slotted at 23<sup>c</sup> to receive through it the shank of a screw 25 which taps into the key, the shank of said screw being smooth within the slot and being screw-threaded only near this point. 80

26 is a single or common return wire for all of the keys located in a groove formed between the rails A, B and C and extending  
85 lengthwise thereof. 27 designates thin springy metal strips soldered to said common return wire to project forwardly therefrom gripped between the rails B and C with the free ends of said strips or tongues located respectively under the downwardly  
90 extending free ends 23<sup>b</sup> of the metal members 23.

When the keys are depressed to play the instrument, said free ends 23<sup>b</sup> of the members 23 on the given keys contact with the  
95 tongues 27 under them and so complete the electrical circuits for those particular keys to operate the related tone-producing devices of the organ. The referred to screws 25 serve to adjust the distance by which the aforesaid parts are normally separated when  
100 the keys are up. Further, it will be noted that the rail C overhangs the rail B so as to act as a stop limiting the upward motion of the spring tongues 27 after they have been depressed by the down stroke of the related  
105 keys.

Changes and modifications may be made in the foregoing practical embodiment of my present improvements which will nevertheless still be within the spirit of the foregoing description and within the meaning  
110 and spirit of the annexed claims and which as such are accordingly intended to be covered thereby.

What I claim is:

115 1. In combination, a manual for a keyboard instrument, supports at the ends of said manual; and pin and groove connections between said ends of the manual and said supports permitting the manual to be  
120 slid into and out of position thereon, said grooves having notches extending laterally therefrom adapted to be engaged by said pins when the manual is in place to prevent  
125 accidental displacement thereof.

2. In combination, multiple superposed manuals for a keyboard instrument, each being an independent unit, supports at the  
130 ends of said manuals, and means for supporting said manuals on said supports per-

mitting each manual to be slid into and out of position independently of the others.

3. In combination, a manual for a key-board instrument, supports at the ends of said manual; and pin and groove connections between said ends of the manual and said supports permitting the manual to be  
5 slid into and out of position thereon, there being two pins projecting from each end of the manual to engage the grooves in the sup-  
10 ports, said grooves inclining downwardly

from their forward open ends to their rear closed ends, which latter act as stops for the rear pins of the manual, and notches extending downwardly from the undersides of said grooves to receive the front pins and lock them against accidental displacement. 15

Signed at New York, in the county of New York and State of New York, this 28th day of June A. D. 1923.

JOHN W. STARKIE.