

March 4, 1941.

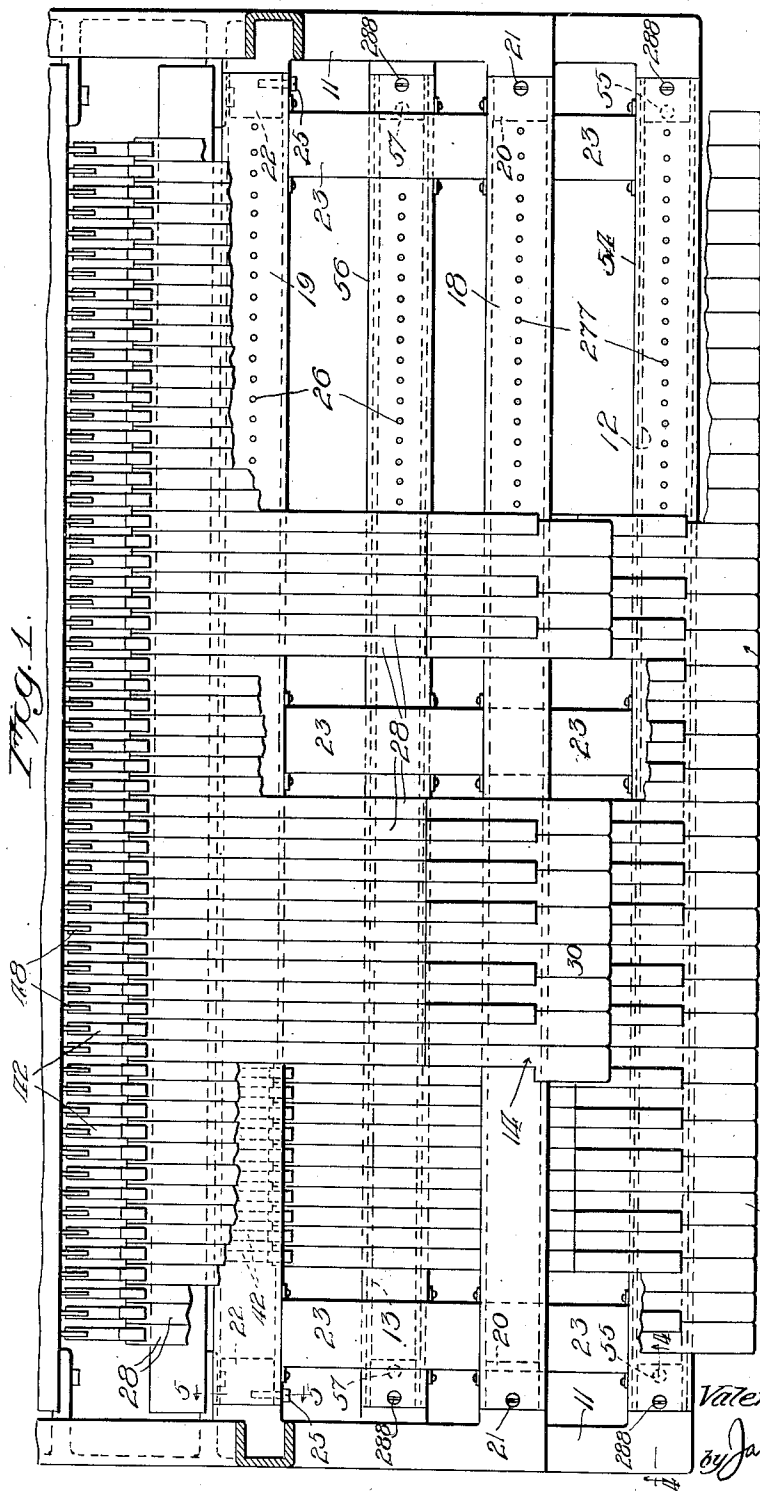
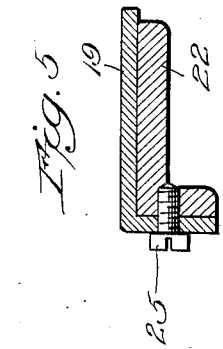
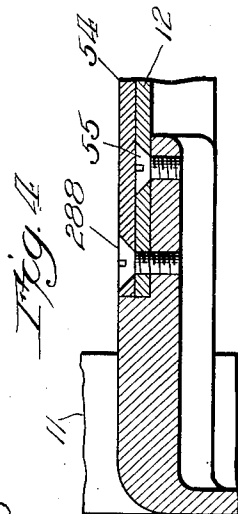
V. J. MOHLER

2,234,055

CONSOLE

Filed July 10, 1939

3 Sheets-Sheet 1



Inventor:
Valentine J. Mohler
by James A. S. Koehn
Atty.

March 4, 1941.

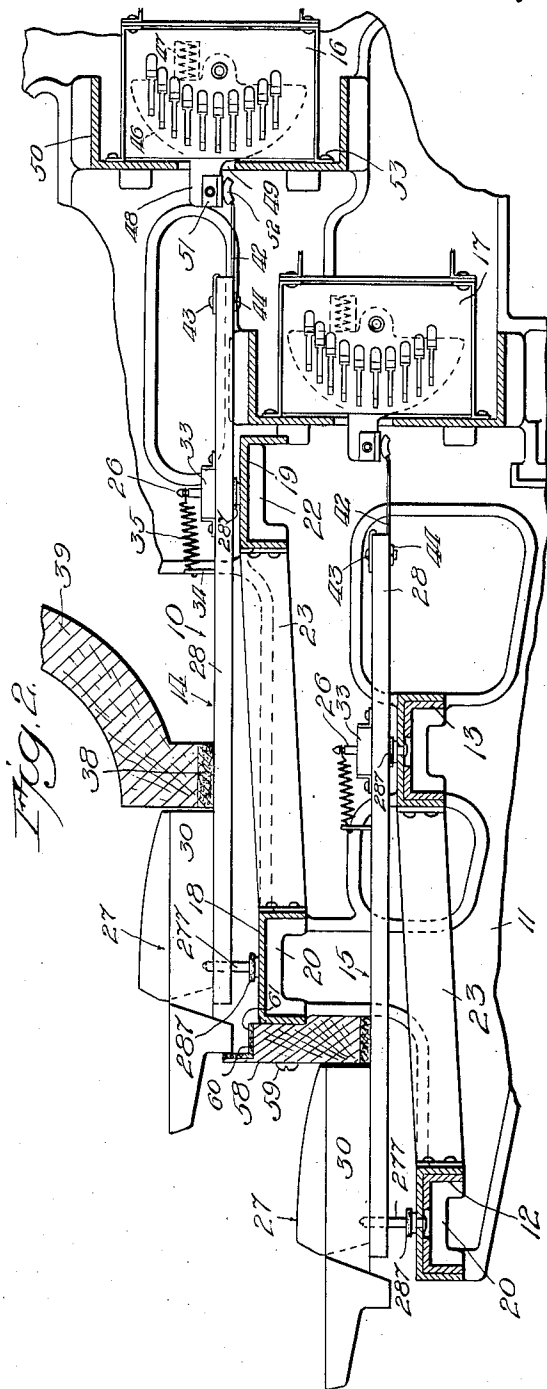
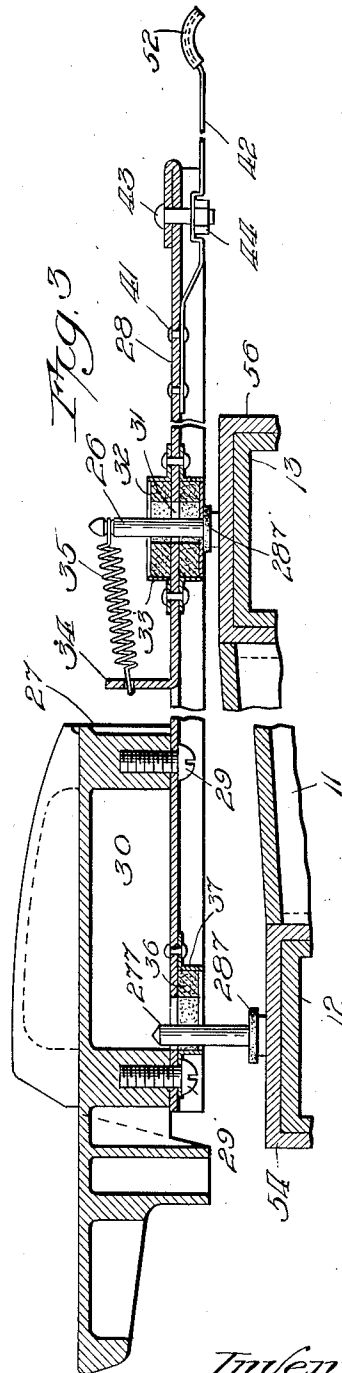
V. J. MOHLER

2,234,055

CONSOLE

Filed July 10, 1939

3 Sheets-Sheet 2



Inventor:
Valentine J. Mohler
by James A. S. Koehl
Att'y.

March 4, 1941.

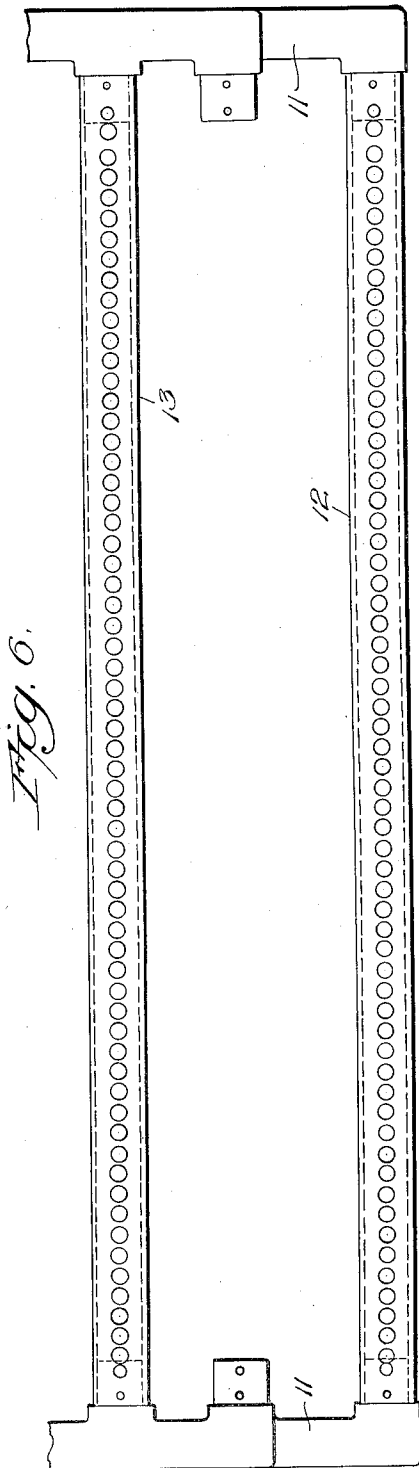
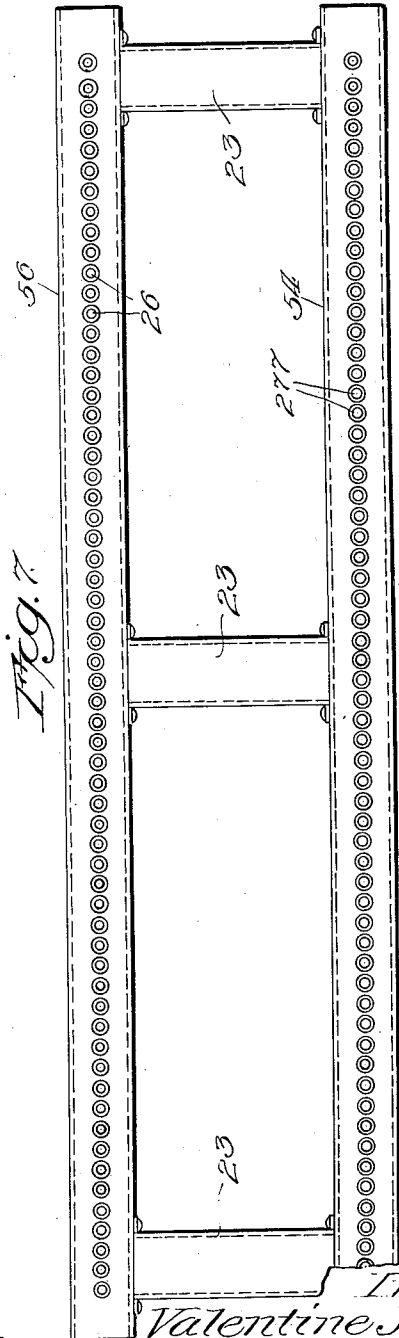
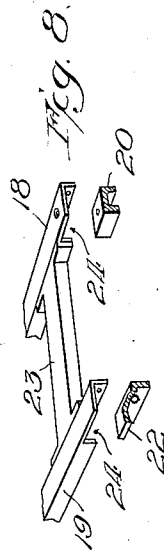
V. J. MOHLER

2,234,055

CONSOLE

Filed July 10, 1939

3 Sheets-Sheet 3



Inventor:
Valentine J. Mohler
by James A. G. Koche.
Atty.

UNITED STATES PATENT OFFICE

2,234,055

CONSOLE

Valentine J. Mohler, River Forest, Ill., assignor to
Central Commercial Company, Chicago, Ill., a
corporation of Illinois

Application July 10, 1939, Serial No. 283,545

4 Claims. (Cl. 84-423)

This invention relates to organ consoles and particularly to consoles primarily but not necessarily designed for use in connection with electrical musical instruments employing switches adapted to be actuated by playing keys to control conduction of alternating voltages at harmonically related tone frequencies to an amplifying system upon depression of said keys.

Among the more important objects of my invention, the following are illustrative:

To provide a console having a keyboard which can be inserted as a unit in or removed as a unit therefrom.

To provide a console, the keyboard of which is designed to enable any individual key to be removed therefrom and reinserted therein without the necessity of removing said keyboard from the console.

To provide a console in which any individual key and/or any individual switch can be removed without disturbing others of the switches relative to each other and to their coacting switches.

To provide a console having a plurality of keyboards constructed, disposed and adapted to enable any one thereof to be inserted as a unit in or removed from the console.

To provide a console, the playing-keys of which and their coacting switches can be quickly assembled and accurately correlated with each other.

To provide a console, the electric switches of which are associated with the playing keys in a manner to prevent derangement of their intended relationship to each other in the ordinary use thereof and during transportation of the instrument.

To provide a console, the switches of which are always correctly related to coacting playing keys.

To provide a console employing electric switches and associated playing-keys and means whereby upon mounting the keyboard in the console, all keys thereof will be simultaneously correctly associated with coacting switches.

To provide a console, the forms, constructions and arrangements of the various parts of which will afford quick and convenient accessibility to individual parts and certain novel assemblies of parts.

To provide a console, the keyboard of which is characterized by non-warping keys which will insure proper alignment of the keys with coacting switches and improve the action of the keyboard.

To provide a console, the keyboards of which are light weight and compact and capable of be-

ing easily handled when assembling the console and when repairs are necessary.

To provide a console, the keyboard of which while being removable as a unit from or insertable as a unit in the console, can be firmly secured to the console frame in a simple manner.

To provide a console, the keyboard of which is characterized by keys, the action of which is silent.

To provide a console employing key-controlled switches and means by which the effective switch-controlling portions of the keys can be adjusted to a nicety relative to coacting switch levers to thereby insure a high measure of accuracy of operation of the switches upon depression of the keys.

With the above and other objects in view, the invention will be better understood upon reference to the following description and the hereto annexed drawings, in which:

Figure 1 is a plan view of the console with parts removed and parts in section for the sake of clearness.

Figure 2 is a transverse section through the console.

Figure 3 is a transverse section through the console in the plane of the upper keyboard.

Figure 4 is a section on line 4-4 of Figure 1.

Figure 5 is a section on line 5-5 of Figure 1.

Figure 6 is a top plan view of a portion of the console showing the supporting means for the lower keyboard.

Figure 7 is a top plan view of the bed-member or frame of the lower keyboard, and

Figure 8 is a fragmentary perspective view of the bed member or frame of the upper keyboard and the supporting lugs of the console frame.

In Figures 1, 2 and 3, I show only as much of a console as is necessary to enable persons trained in the art to practice my invention. 10 denotes the console as a whole, the same including a frame embodying longitudinally spaced apart end members 11, connected together by rectilinear tie-rails 12 and 13. 14 denotes an upper keyboard; 15 an identical lower keyboard; 16 an upper set of electric switches and 17 a lower set of similar switches. The switches of each set are disposed in longitudinal row formation, such that there is one such row for the keys of the upper keyboard and one row for the keys of the lower keyboard. The said rows of switches are stepped relatively and disposed at respectively different elevations.

The upper keyboard 14 comprises a pair of rectilinear channel bars 18 and 19, the former of

which has its respective ends in straddling relation to short, inwardly projecting lugs 20 upon the inner faces of the end frame members 11 of the console frame and removably secured thereto by machine screws 21. The channel bar 19 has its ends similarly mounted upon lugs 22 of said console frame members 11. Cross bars 23 rigidly connect the bars 18 and 19 together and coact therewith to provide a bed or common mounting for the entire assembly of keys of the upper keyboard. In Figure 8, it is noted that the back flanges of the channel bars 18 and 19 are cut away at 24 whereby upon releasing the aforementioned fastenings 21 and the similar fastenings 25, the latter removably securing the bar 19 to its supporting lugs 22, the entire keyboard can be withdrawn as a unit from the console, it being merely necessary to move same forwardly in a horizontal plane.

The bars 18 and 19 are disposed at respectively different elevations, the front bar 18 occupying a lower plane than the rear bar 19. The upper bar 19 has a longitudinal row of fulcrum pins 26, there being one such pin for each of the playing keys 27. The lower bar 18 has a similar row of guide pins 271. Each of the first and last named pins has a felt washer 287 at its lower end for cushioning the action of an associated playing key. Each key comprises a rigid bar 28 of suitable gauge metal, the forward end of which is secured by screws 29 to a member 30 of any well known composition of matter in simulation of ivory. The pin 26 passes through the bore 31 of a felt body 32, the latter encased in a cylindrical metallic shell 33. Upstruck from the key bar 28 is an angular lug 34 to which one end of a coil spring 35 is attached, the opposite end of which is detachably connected to the upper end of the pin 26 as shown in Figure 3. The pin 277 upon the bar 18 passes through the bore of a felt body 36, the latter contained within a cylindrical metallic shell or jacket 37 secured to said bar 28.

By reason of the fact that the bars 18 and 19 are disposed at different elevations, it follows that under the normal tension of the spring 35, the key is held elevated and against the felt face 38 of a removable stop strip 39. Hence, a clearance is provided between the bottom of the key and the upper surface of the bar 18 such that the key can be operatively depressed.

Secured to the back end of the key bar as at 41 is a leaf spring 42 and passing through the spring is an adjusting bolt 43 carried by the key bar, the nut 44 of the bolt being disposed under the spring and serving to effect vertical adjustment of the free end of the spring for a purpose to appear presently.

The individual switches of the upper set of switches 16 are spaced apart from each other a distance longitudinally such that each switch is individual to an associated playing key 14, and as illustrated, each switch has a control lever 46 which is normally open circuited by the action of a spring 47, assuming of course, that its associated playing key is elevated. The lever 46 has a short arm 48 which extends through a slot 49 in a housing section 50, and as illustrated said arm 48 has a smooth metallic wear plate 51 against the bottom surface of which the curved metallic wear surface 52 of the spring 42 bears just lightly enough to establish a close relation between said surfaces while preventing any expenditure of yielding stress of one against the other. In Figure 2, it is noted that the arm 48 normally occupies a horizontal position and that

any desired vertical adjustment of the spring can be obtained so that the wear surface 52 of the spring can be operatively correlated with said wear plate 51 of said arm 48.

The individual switches 16 of the set of 5 switches for the upper keyboard are each secured to the housing section 50 by screws 53, whereby said switches can be removed from the console through the back thereof without disturbing others of the switches or the playing-key of the 10 switch being removed.

Except for minor details, the lower keyboard is the same as the upper keyboard and the description of the latter will therefore suffice for the former. However, it is noted that the forwardly 15 disposed channel bar 54 of said lower keyboard straddles the tie-bar 12 and is removably secured thereto by machine screws 55. The rearwardly disposed channel bar 56 straddles the tie-bar 13 and is secured thereto by machine screws 57. As all of the remaining essential structural elements of the lower keyboard are the same as like elements of the upper keyboard, the reference numerals denoting the parts of the upper keyboard will therefore identify similar parts of the lower 25 keyboard. Obviously, the relation between any key of the lower keyboard to an associated switch of the lower set of switches is the same as that set forth in the description of the keys of the upper keyboard and their associated switches. 30

The electric switches employed herein are fully shown and described in my co-pending application Ser. No. 274,871, filed May 22, 1939 and it will suffice to say that when any playing key is depressed, its associated switch is close circuited with respect to alternating voltage sources from 35 which voltages at harmonically related tone frequencies are conducted to an amplifying system, thence to an electrical sound producer which converts the amplified voltages into sound. 40

To the best of my knowledge, the feature of my invention which consists in providing a console, any keyboard of which is removable from or insertable therein as a complete unit is new in the art and never before has been accomplished in 45 musical instruments employing playing keys. Nor, to the best of my knowledge has it even been possible heretofore to remove any individual playing key from or enable free insertion of same in the keyboard without the necessity of dissociating others of the keys and removing them from the console. Nor, to the best of my knowledge has anyone ever before associated the individual keys of a keyboard with circuit controlling 50 switches in a manner enabling any switch and/or any key to be freely removed whenever the necessity therefor arises. These features taken singly or together represent important advancement in the art and accordingly will be claimed both broadly and specifically and per se as well as in 60 certain novel combinations. I stress also the form and construction of a console frame which embodies lugs 20 and 22 or their equivalents, upon which the channel bars 18 and 19 are detachably supported, and the form of the channel 65 bars 12 and 13 connected at their ends to lugs of the frame members 11 and upon which channel bars 12 and 13, the channel bars 54 and 56 of the lower keyboard are removably mounted. The forms and arrangements of the parts as 70 shown and described are such that each keyboard is correctly centered upon the console frame members in a manner whereby all terminals 52 of the springs 42 of any assembly of playing-keys are simultaneously correctly associated with the 75

arms 48 of coacting circuit controlling switches when the keyboard is installed.

When it is desired to remove the lower keyboard from the console, the fastenings 288 which secure the channel bars 54 and 56 to their respective channel bars 12 and 13 are removed, after which, it merely is required to lift the entire keyboard vertically, sufficiently to clear the pins 26 and 277 and draw same forwardly in a straight horizontal direction. Any individual key of the keyboard can be readily removed upon first disconnecting the spring 35 from an associated pin 26, and lifting the key vertically and withdrawing same through the front of the console.

When it is desired to remove the upper keyboard as a unit, it simply is necessary to release the fastenings which secure the bars 18 and 19 to the lugs 20 and 22, at which time, the entire keyboard can be drawn forwardly in a straight horizontal direction.

By reason of the forms and arrangements of the circuit controlling switches herein employed, it follows that the yielding arms 48 thereof readily compensate or adapt themselves to any angular motion of an individual playing key either when removing the key from or inserting same in the keyboard or when removing the keyboard as a unit from or inserting same in the console.

In Figure 2, the stop strip 58 is removably secured to the console frame members 11 by screws 59. Said strip has an upper felt face 60 which underlies the keys of the upper keyboard, and a lower felt face 61 which overlies the keys of the lower keyboard, thereby cushioning the action of the keys as will be understood.

In addition to the main features of my invention as heretofore pointed out, I stress the novel features which characterize the individual playing keys, the metal bar 28 of each of which provides a thin, stiff, non-warping structure which not only maintains a definite relationship between the spring 42 of the bar and an associated arm 48 of a circuit controlling switch, but also provides for easy manipulation of the bar when inserting a key in or upon removing same from the keyboard.

I particularly emphasize the novel features of a console which include electric switches, mounted and disposed so that they can be conveniently removed from the back of the console, and keyboards, adapted readily to be removed from the front of the console and whose keys may be individually removed as the occasion therefor arises.

What I claim as my invention is:

1. An organization of the class described comprising a set of electric switches, means for mounting said switches to enable any individual switch to be removed from said set, each switch having a vertically movable circuit controlling

lever, a keyboard disposed forwardly of said set of switches and comprising a playing key for each individual switch, each key having a portion at its back end removably associated with the circuit controlling lever of a respective switch and adapted to bear against and move the lever in a circuit closing direction when depressing said key, and means by which the keyboard can be mounted as a unit in front of said switches and similarly removed therefrom and for simultaneously effecting an operating relation of the back end portions of all keys with the circuit controlling levers of respective switches when mounting the keyboard in front of said switches as aforementioned.

2. In an organization of the class described, a keyboard, a longitudinal row of similar electric switches, each switch having a vertically tiltable circuit controlling lever yieldingly maintained in an open circuit position, a leaf spring at the back of each key and having a free end yieldingly pressing against the circuit controlling lever of a respective switch to maintain said lever in an open circuit position when the key is elevated and move said element in a circuit closing direction when depressing said key, and means by which said spring can be adjusted to regulate the pressure thereof against said lever when said key is elevated.

3. A playing key for electrical musical instruments employing an electric switch having a vertically movable circuit controlling element yieldingly maintained normally in an open circuit position, comprising a key-bar fulcrumed for vertical motion, means for yieldingly maintaining said key-bar in a playing position and a vertically adjustable leaf spring at the back end of said key-bar and having a free end removably associated with said lever and adapted to impart motion in a circuit closing direction to said lever when playing pressure is imposed upon said key-bar.

4. An organization of the class described comprising a set of electric switches in which each individual switch is provided with a fixed contact element and a coacting movable contact element and a spring for urging the movable contact element in a direction to cause closed circuit engagement of the movable contact element with said fixed contact element; a key-manual having a yieldingly supported key for the movable contact element of each individual switch of said set of switches and including a leaf spring upon which the movable contact element rests freely and serving to counteract the force of the urging spring for said movable element when the key is elevated and being adjustable relative to said element to insure an open circuited relation of the latter to said fixed contact element when the key is elevated.

VALENTINE J. MOHLER.