

Nov. 29, 1932.

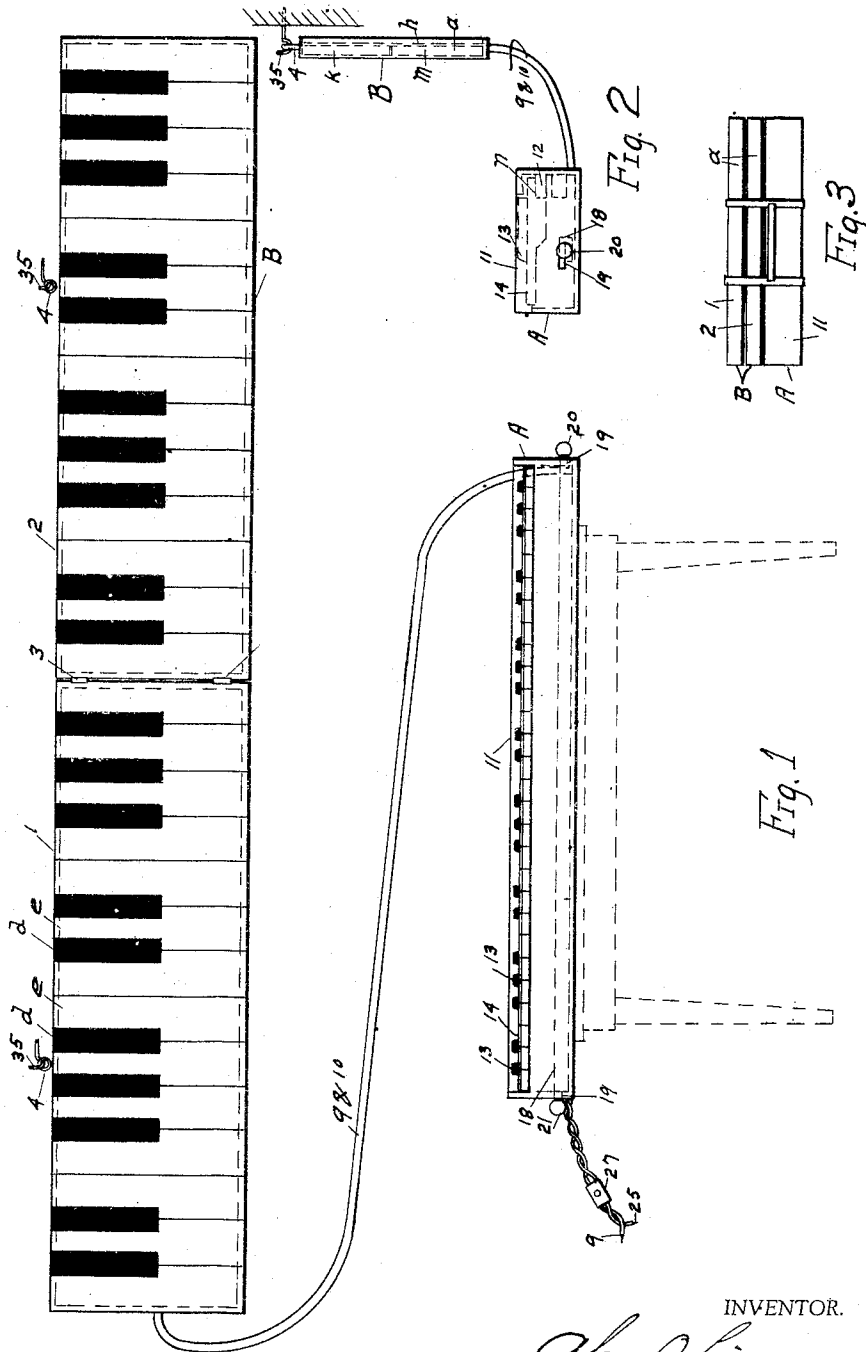
G. O. PIERCE

1,889,418

PIANO INSTRUCTION DEVICE

Filed July 20, 1931

5 Sheets-Sheet 1



INVENTOR.

G. O. Pierce
BY *Myron J. Dickman*
ATTORNEY.

Nov. 29, 1932.

G. O. PIERCE

1,889,418

PIANO INSTRUCTION DEVICE

Filed July 20, 1931

5 Sheets-Sheet 2

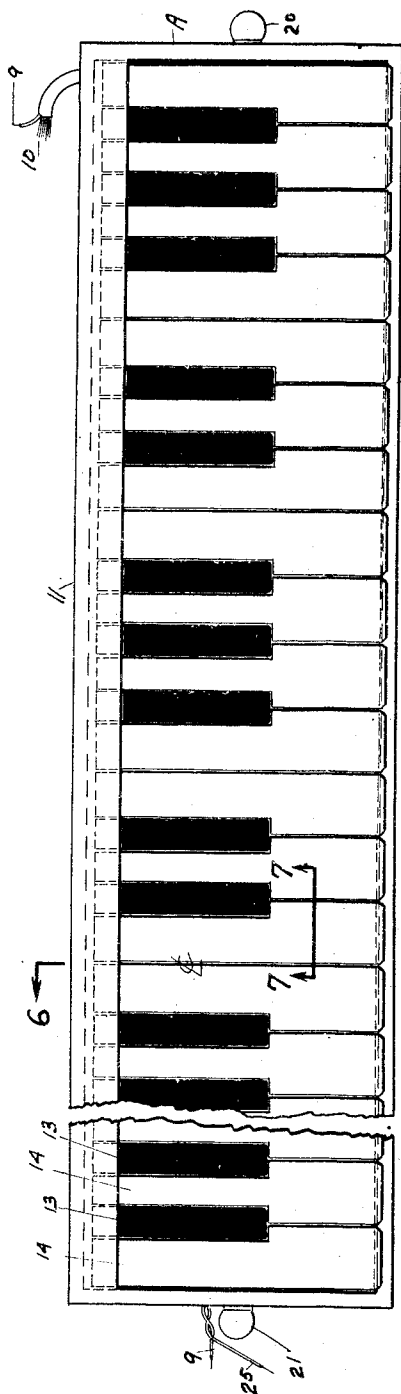


Fig. 5

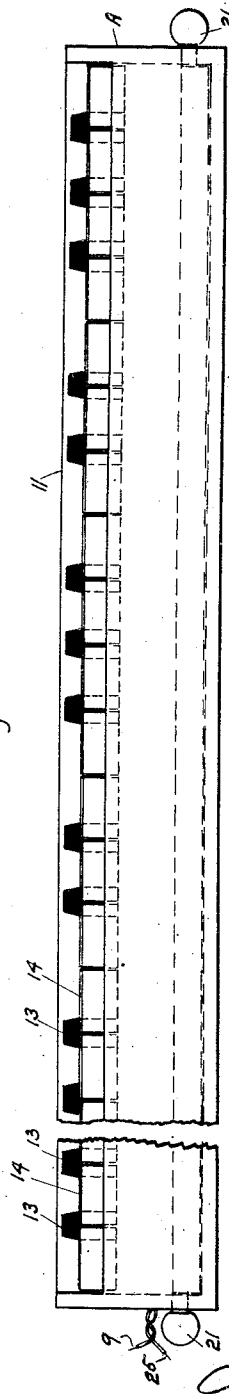


Fig. 6

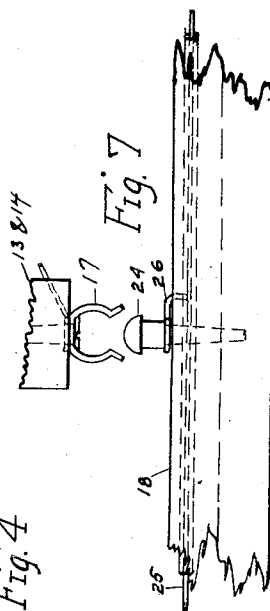


Fig. 7

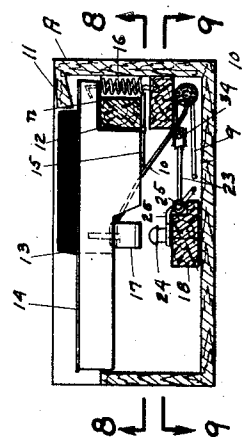


Fig. 8

INVENTOR.

Glen O. Pierce
BY *Myron J. Dikman*
ATTORNEY.

Nov. 29, 1932

G. O. PIERCE

1,889,418

PIANO INSTRUCTION DEVICE

Filed July 20, 1931

5 Sheets-Sheet 3

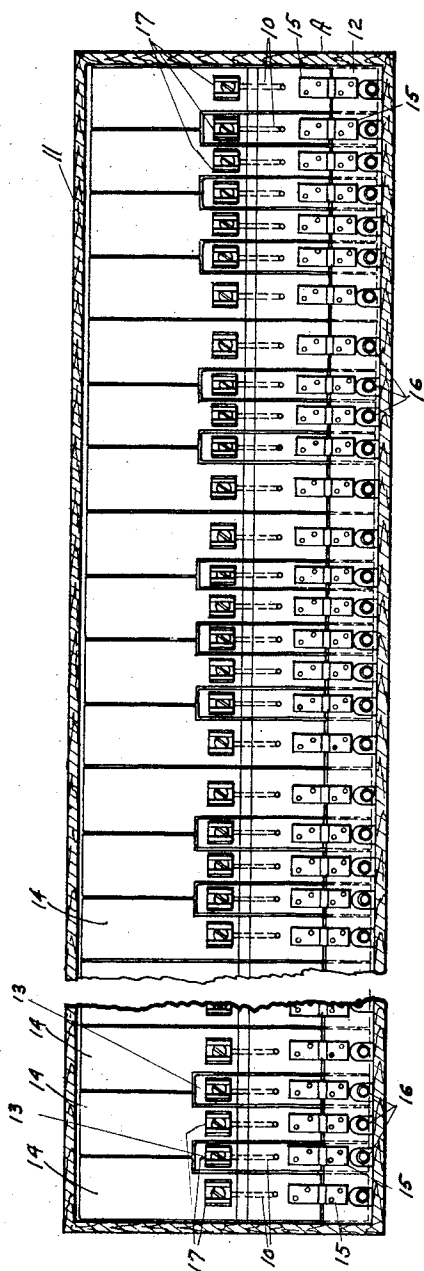


Fig. 8

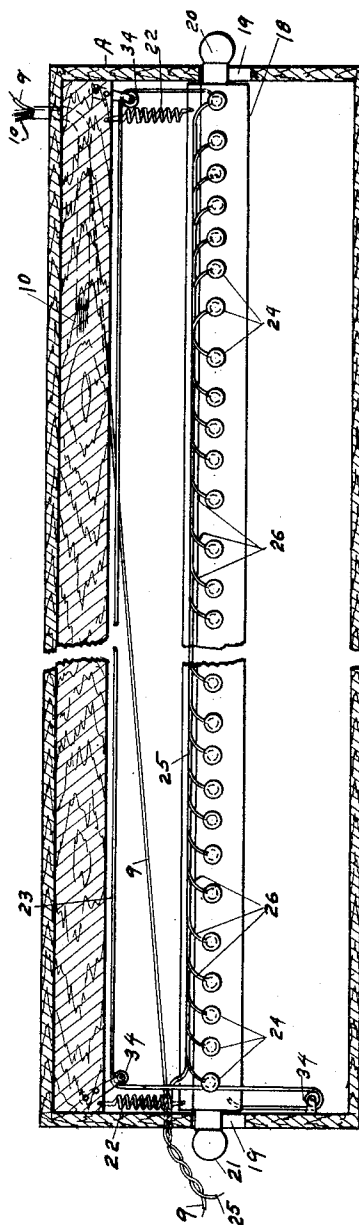


Fig. 9

INVENTOR.

BY *Glen O. Pierce*
Myron J. Dikeman
ATTORNEY.

Nov. 29, 1932.

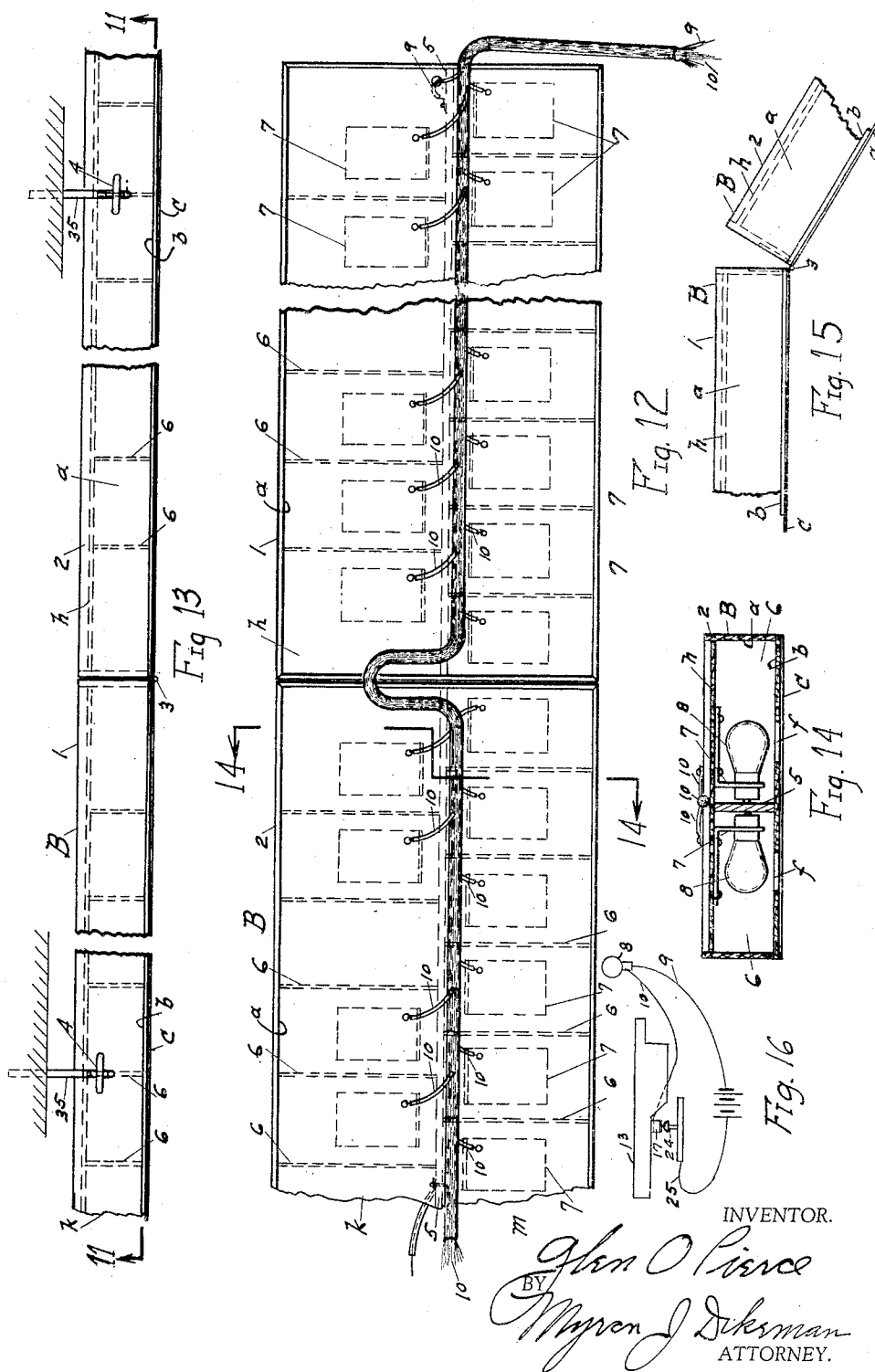
G. O. PIERCE

1,889,418

PIANO INSTRUCTION DEVICE

Filed July 20, 1931

5 Sheets--Sheet 5



UNITED STATES PATENT OFFICE

GLEN O. PIERCE, OF DETROIT, MICHIGAN

PIANO INSTRUCTION DEVICE

Application filed July 20, 1931. Serial No. 551,951.

The object of my invention is to provide mechanical means for instructing a group of pupils in the art of piano playing, by visibly reproducing the key board action on an enlarged instruction wall board, and without the use of a piano or other similar musical instrument.

Another object is to produce a music instruction device whereby the piano key board action for any piece of music may be duplicated on a miniature operating key board and reproduced electrically on an enlarged instruction wall board where the key action is clearly visible to a class of music students.

A further object is to provide a miniature operating key board with keys arranged similar to a piano key board, whereby any key or combination of keys may be depressed in a manner for restraining the keys in such depressed positions until released by special mechanism, and at the same time form an electrical contact in a circuit leading to the corresponding keys of the wall instruction board for producing signal lights therein.

A still further object is to produce a small, portable piano instruction device suitable for carrying from place to place, that is simple in construction, easily and efficiently operated and that can be manufactured at a very low cost.

These several objects are attained in the preferred form by the construction and arrangement of parts as are more fully herein-after set forth.

Similar parts on all drawings are marked by similar numerals or letters.

Fig. 1 shows my instruction device completely assembled as appears when ready for use.

Fig. 2 is an end view of the assembled device showing the relative position of the miniature key board and instruction wall board.

Fig. 3 shows the sections folded and packed together in a form for easily carrying the device.

Fig. 4 is a front view of the miniature key board box showing the operating keys mounted therein and the key release bar.

Fig. 5 is a top view of the operating key

board box showing the relative position of the various operating keys.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5 showing the key arrangement and the operating parts connected therewith.

Fig. 7 is an enlarged sectional detail view taken on the line 7—7 of Fig. 5 showing the electrical contact means as is attached to the bottom side of each key.

Fig. 8 is a horizontal sectional view taken on the line 8—8 of Fig. 6 showing the key mountings and electrical contact clips.

Fig. 9 is another horizontal sectional view taken on the line 9—9 of the Fig. 5 showing the release bar with the series of electrical terminals mounted thereon, and the bar operating means.

Fig. 10 is an enlarged section of the front face of the instruction wall board showing the key positions and the light openings formed beneath the transparent sheet cover.

Fig. 11 is a front view through the wall board taken on the line 11—11 of Fig. 13, the front cover board being removed, showing the inner light compartments and light bulbs mounted therein.

Fig. 12 is the back view of the instruction wall board showing the electrical wiring mounted thereon for connecting the various light bulbs in separate circuits.

Fig. 13 is a top view of the wall board showing the support means and the relative position of the double frame section.

Fig. 14 is a cross section of the wall board taken on the line 14—14 of Fig. 12 showing the interior arrangement of the light bulbs and means for making electrical connections thereto.

Fig. 15 is a section of the top view of the wall board at the center showing the hinge connection between the frame sections.

Fig. 16 is a diagram of the electrical circuit.

I will now describe more fully the detailed construction of my device, referring to the drawings and the marks thereon.

In general, my device comprises a miniature operating key board box —A—, connected electrically to an enlarged instruction wall board —B— designed to represent a piano

key board, the wall board being provided with small electric light bulbs placed beneath the various key positions, capable of lighting the respective keys as the corresponding keys of the miniature key board box are depressed.

5 The instruction wall board —B— is preferably made of two elongated, rectangular sections —1— and —2— of equal dimensions, positioned end to end and joined together by the hinges —3—, forming a continuous wall
10 board face. The sections —1— and —2— are each made of a rectangular rim frame —a—, preferably formed of thin, light wood sections securely joined together at the corners, said rim frame being completely covered on
15 one side by a front board —b— securely attached thereto. The outer faces of the front boards —b— are covered with transparent sheet covers —c—, preferably cloth, and designed, by painting or otherwise, to represent black and white key positions —d— and
20 —e—, the two frame sections —1— and —2— when unfolded, representing the complete key positions of the ordinary piano key board. Through the front boards —b—, directly
25 beneath the transparent sheet covers —c—, are formed series of light openings —f—, one opening being positioned beneath each of the key positions —d— and —e— for admitting light to the transparent sheet
30 cover and to designate chosen key positions indicated thereon. The back sides of the frame rims —a— are also closed by the back boards —h— securely and fixedly attached to the rim walls, forming enclosed chambers
35 within the frame sections —1— and —2—.

Small supports rings —4— are fixedly mounted along the top edge of the wall board frame, providing means for suspending the
40 wall board from suitable support hooks —5—, or the frame may be supported on any shelf or table support if desired.

The chambers within the frame sections —1— and —2— are divided into two parallel series of light recesses —k— and —m—
45 by a longitudinal metal contact bar —5— centrally positioned lengthwise the respective frame sections, and the cross partition walls —6— leading thereto, each light recess being positioned directly back of one of the
50 key positions —d— or —e— as indicated on the sheet cover —c—. Within each of the light recesses —k— and —m— is mounted a metal bulb frame —7— fixedly attached to the back boards —h—, and each bulb frame
55 carries a small electric light bulb —8— securely inserted therein and grounded against the longitudinal contact bar —5— which is connected in an electric circuit by a common
60 terminal wire —9— attached thereto. Each of the bulb frames —7— is provided with a separate terminal wire —10— attached thereto for forming a complete electric circuit through each light bulb —8— separately
65 when their respective terminal wires —10—

are closed in circuit with the common terminal wire —9— through the connecting terminal bar —5—, thus providing means for lighting any chosen bulb —8— independently of the others. The bulbs —8— are positioned within the light recesses —k— and
70 —m— directly behind the respective light openings —f— of the front board —b—, capable of clearly radiating the light from the bulbs through the transparent sheet covers —c— for indicating, visibly, chosen key
75 positions to be followed by the observing pupils.

The operating key board box —A— is made of a small rectangular box casing —11— open at the top, and preferably made of some light material such as wood or some
80 suitable light metal, and is provided with a rectangular shaped key bar —12— fixedly attached along the inner face of the back casing wall, near the top edge thereof, said key
85 bar —12— being extended the full casing length. Pivotaly mounted on the key bar —12— are series of black and white operating keys —13— and —14—, preferably of wood suitably topped, designed and positioned
90 similarly to a piano key board, each operating key being connected to the key bar —12— by a hinge —15— attached along the bottom sides of both keys and bar. All keys —13— and —14— being formed with a rectangularly notched recess —n— at the back
95 ends thereof for fitting over and engaging the key bar —12— when the keys are in a horizontal position, and each key is provided with a light key spring —16— attached to the back end thereof for retaining the keys
100 in a horizontal position when not depressed by the operator. Along the bottom sides of each of the operating keys —13— and —14— is mounted a spring contact clip —17— fixedly
105 attached to the respective keys by screw means, said contact clips being positioned thereon near the outer ends of the black operating keys —13— and in a straight alignment lengthwise the casing —11—. Directly
110 beneath the line of contact clips —17— is a contact bar —18—, also extended the full length of the casing —11— and slidably mounted therein by the extended bar ends engaging slotted recesses —19— formed
115 through the casing end walls, allowing a slight sidewise displacement of the bar therein. The bar ends are preferably provided with suitable hand knobs —20— and —21—
120 for more conveniently displacing the bar as desired. Small tension coil springs —22— are attached to each bar end and to the back casing wall for retaining said contact bar —18— in its back position directly beneath
125 the line of contact clips —17— when released. For more conveniently moving the bar —18— by one hand knob —20— only, an operating cord —23— may be attached to both of the bar ends and arranged through
130

a series of cord pulleys —24— as indicated in Fig. 9 of the drawings, and which will displace both bar ends simultaneously if pressure is applied to the hand knob —20—. If double cords were attached to the bar, oppositely arranged, the bar could be likewise displaced from either bar end. Along the top face of the contact bar —18— is mounted a series of contact plugs —24—, in straight alignment with and directly beneath the line of contact clips —17— when said bar —18— is in its back position, one plug —24— beneath each clip —17—, and capable of engaging therewith if the operating keys —13— or —14— are depressed lightly thereon, and if sufficient pressure is applied to the operating key the spring contact clip —17— will snap over the contact plug head —24— and retain the said keys in the depressed position until released by a sidewise displacement of the contact bar —18—. Along one edge of the contact bar —18— is mounted a common terminal conduit wire —25— and which is electrically connected to each of the terminal plugs —24— by short wire connectors —26—. Also each of the contact clips —17— as mounted on the bottom of the operating keys —13— and —14— is provided with a separate insulated electric terminal wire —10—, the same being the extension of the terminal wire —10— of the wall board —B— for the correspondingly positioned key. The common terminal wire —9— of the wall board —B— and the terminal wire —25— of the operating key board box —A— are connected in any suitable electric circuit, such as a battery circuit or any suitable lighting circuit, and preferably provided with an operating switch —27— mounted therein in the ordinary manner, the wiring for each key being illustrated in the diagram shown in Fig. 16 of the drawings. When the switch —27— is closed and any of the operating keys —13— or —14—, or both, are depressed sufficiently to form a contact between the clips —17— and terminal plugs —24—, the light bulbs —8— beneath the corresponding key positions of the wall board —B— will be lighted, and the key positions visibly indicated to the class of observing music students who may then assume the same position on their desk finger charts. Continuing and successive depressions of the keys —13— and —14— may be made by the music instructor, or operator, all repeated by the students on their finger charts, thus instructing them in the playing of an entire piece of music or exercise, and in case the instructor may desire to leave the key box for observing the correctness of the pupil's finger positions on their respective charts, any depressed key positions may be continued by simply depressing the desired keys sufficiently hard to engage the contact clips —17— with the corresponding terminal plug —24—, thus

retaining the lighted positions of the corresponding keys on the wall board —B— until released by a side displacement of the contact bar —18— which moves the terminal plugs —24— outward and away from the clips —17—, allowing the keys to all assume their normal horizontal positions.

My device is especially adapted for group instruction in piano playing, such as in school rooms where no piano is available, and when the device is not in use it may be readily folded and packed together as shown in Fig. 3 of the drawings, for easily carrying from one room or place to another.

Having fully described my piano instruction device, what I claim as my invention and desire to secure by Letters Patent is:

I claim:

1. A piano instruction device, comprising an operating key board box, an instruction wall board designed replica of a piano key board, and means for connecting each of the key positions of said wall board electrically to the correspondingly positioned key of the operating key board box in a manner capable of producing a visible signal for each wall board key position when the corresponding key of the operating key board box is depressed and capable of continuing the signal positions until released.

2. A piano instruction device, comprising an operating key board box of light penetrating material, a wall instruction board designed as a replica of a piano key board and having individual lighting means mounted beneath each key position capable of radiating light therethrough, and means mounted thereon for connecting each of the said key lighting means electrically with the correspondingly positioned key of the operating key board box in a manner capable of producing light beneath each wall board key position as the corresponding key of the operating key board box is depressed capable of continuing said lights until released.

3. A piano instruction device, comprising an operating key board box having keys arranged therein like a piano key board, each of said operating keys being provided with a closing switch means capable of locking when closed, an instruction wall board of transparent material designed as a replica of a piano key board and provided with an individual electric light bulb beneath each key position in separated compartments capable of radiating light therethrough, means mounted thereon for connecting each light bulb electrically to the switch means of the correspondingly positioned key of the operating key board box, and means for connecting said light bulbs and closing switches for the respective keys in separate electric circuits and capable of producing a signal light beneath the key positions of the transparent wall board when the corresponding key of the operating key board

box is depressed, and means for releasing the depressed key board box keys.

4. A piano instruction device, comprising an operating key board box having operating keys pivotally mounted therein and arranged like the keys of a piano key board, each of said keys being provided with spring means for retaining the key in a horizontal position, also with separate electric switch means capable of locking when closed, an enlarged instruction wall board of transparent material designed as a replica of a piano key board and provided with a separated light compartment and an electric light bulb positioned beneath each of the key positions and capable of radiating light therethrough when the bulb is lighted electrically, and means mounted thereon for connecting each key light bulb electrically to the correspondingly positioned key of the operating key board box, and means for connecting said light bulbs each in a separate electric circuit passing through the individual switch means of the correspondingly positioned key of the operating key board box and capable of lighting the bulb behind any transparent key position of the wall board when the corresponding key of the operating key board box is depressed and means for releasing the depressed key board box keys.

5. A piano instruction device, comprising an operating key board box having keys pivotally mounted therein and positioned like the keys of a piano key board, each of said operating keys being provided with spring means for retaining the key in a horizontal position, also with an individual electric terminal with terminal wire attached thereto, a common terminal bar mounted beneath the key terminals capable of engaging and locking with all of the key terminals when depressed thereon, an enlarged instruction wall board of transparent material designed as a replica of a piano key board and provided with separated light compartments and a small electric light bulb placed therein beneath each key position capable of radiating light therethrough when the bulb is lighted, means for connecting one terminal of each light bulb with the individual key terminal wire of the correspondingly positioned key of the operating key board, a common terminal bar mounted within said wall board for engaging the opposite bulb terminal of all of the light bulbs, and means for connecting said terminals in an electric circuit.

6. A piano instruction device, comprising an operating key board box having keys pivotally mounted therein and positioned like the keys of a piano key board, each of said operating keys being provided with a spring member for retaining the key in a horizontal position, also provided with an individual electric terminal with terminal wire attached thereto, a common terminal

bar mounted beneath the key terminals and provided with individual terminals positioned one beneath each of the key terminals and capable of engaging and locking therewith when the corresponding operating key is depressed thereon for retaining the key in the depressed position, means mounted on said terminal bar for releasing the key terminals, an instruction wall board of transparent material designed as a replica of a piano key board and provided with separated light compartments and a small electric light placed beneath each of the key positions capable of radiating light therethrough, means mounted thereon for connecting one terminal of each key light bulb with the individual key terminal wire of the correspondingly positioned key of the operating key board and means mounted thereon for connecting the opposite light bulb terminals in an electric circuit connected to pass through the terminal bar of the operating key board box.

7. A piano instruction device, comprising an operating key board box having keys pivotally mounted therein and positioned like the keys of a piano key board, each of said operating keys being provided with a spring member for retaining the key in a horizontal position, also with an individual electric terminal with terminal wire attached, a terminal bar movably mounted beneath the key terminals and provided with terminal projections thereon positioned one beneath each of the key terminals and capable of engaging and locking therewith when the keys are depressed thereon, means mounted on said terminal bar for causing a displacement thereof for breaking the terminal connections with the various operating keys, an instruction wall board of light penetrating material designed as a replica of a piano key board and provided with a small electric light bulb placed beneath the key positions but separated from each other by compartment walls and capable of radiating light through the respective key positions, means mounted thereon for connecting one terminal of each of the key light bulbs with the individual key terminal wire of the correspondingly positioned key on the operating key board, means mounted thereon for connecting the opposite light bulb terminals in an electric circuit passing through the terminal bar of the operating key board box.

8. An instruction wall board to be used in combination with an electrically operated key board box, comprising a thin, flat frame inclosure having one face of a transparent material and designed as a replica of a piano key board, small electric light bulbs mounted within the frame inclosure in individual light compartments arranged and positioned with one light bulb beneath each key position and capable of radiating light therethrough, and means mounted thereon for connecting said

light bulbs in separate lighting circuits.

9. An instruction wall board adapted for piano instructions and to be used in combination with an electrical operating key board box, comprising two thin, flat, frame inclosures joined together at the center by hinge members and having one face of a transparent material and designed as a replica of a piano key board, a common electric terminal bar centrally mounted through the inclosures and provided with means for connecting same in an electric circuit, small light bulbs mounted within the frame inclosures within separated light compartments and having one terminal grounded with the common electrical terminal bar, said light bulbs being so arranged and positioned that one bulb is beneath each of the key positions capable of radiating light therethrough, and means mounted thereon for connecting the opposite terminal of each light bulb within a separate electric circuit passing through said common terminal bar.

10. An operating key board device to be used in combination with an electrical instruction wall board, comprising a suitable casing having a series of operating keys pivotally mounted therein, each of said keys being provided with a spring member attached thereto for retaining the keys in a predetermined position within the casing, an electric terminal with terminal wire attached fixedly mounted on each of the operating keys, and corresponding fixed terminals mounted within the casing positioned directly beneath the key terminals so as to engage therewith when the respective operating keys are depressed, and means for connecting said fixed terminals to a common terminal wire.

11. An operating key board adapted for use in combination with an electrical instruction wall board, comprising a suitable casing having a series of operating keys pivotally mounted therein and positioned like the keys of a piano key board, each of said keys being provided with a spring member for retaining said keys in a predetermined position within the casing, an electric terminal with terminal wire attached fixedly mounted along the bottom side of each of the operating keys, a terminal bar movably mounted through the casing directly beneath the key terminals, said bar being provided with a series of fixed terminals mounted thereon and positioned with one terminal beneath each of the key terminals and capable of engaging therewith when the keys are depressed thereon for holding the said keys in a depressed position, means mounted thereon for connecting all of the fixed terminals to a common circuit wire, and means provided for displacing the terminal bar for disengaging the fixed terminals from the key terminals.

In witness whereof I sign this specification.

GLEN O. PIERCE.