

Dec. 17, 1940.

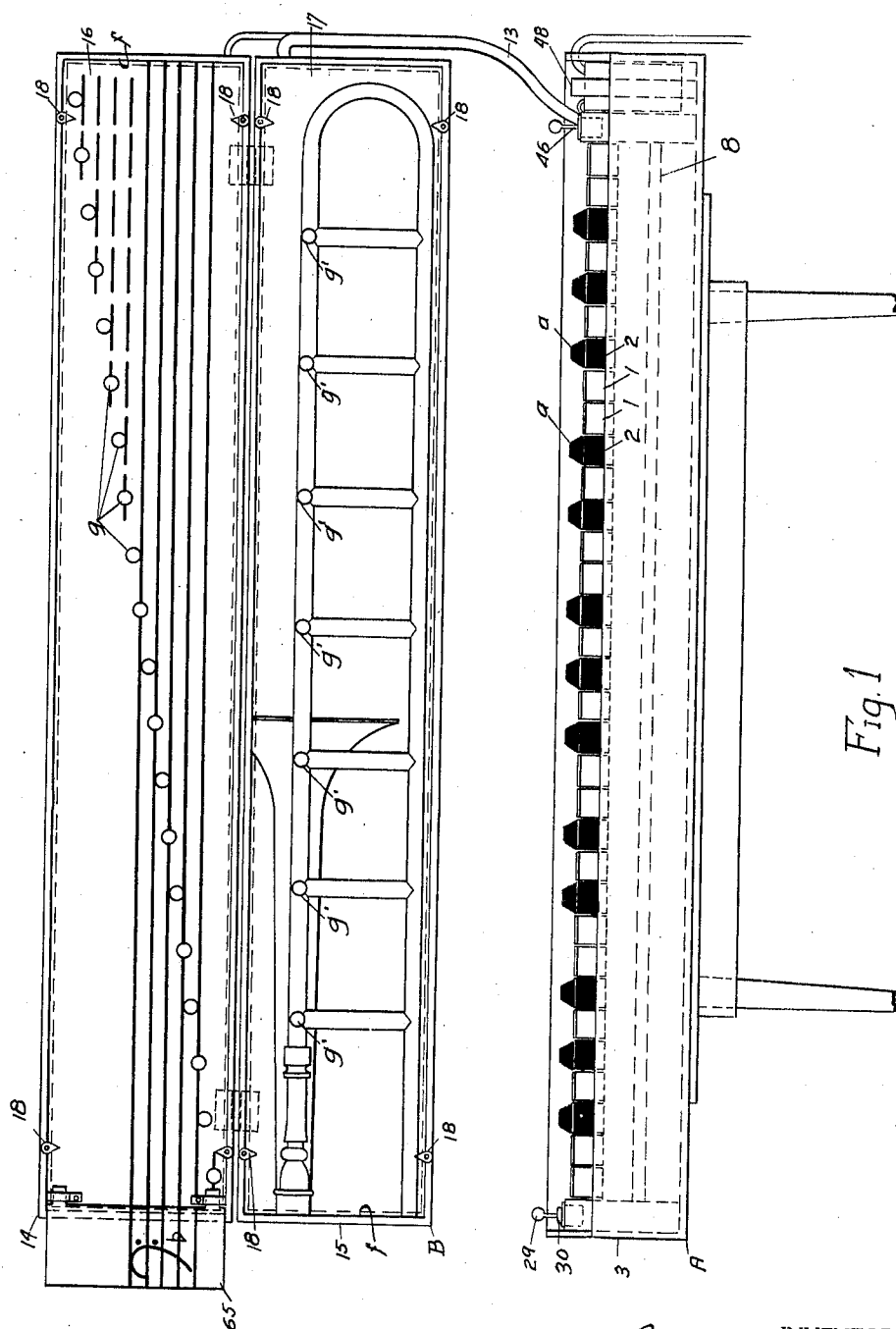
G. O. PIERCE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Filed March 20, 1939

6 Sheets-Sheet 1.



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

Dec. 17, 1940.

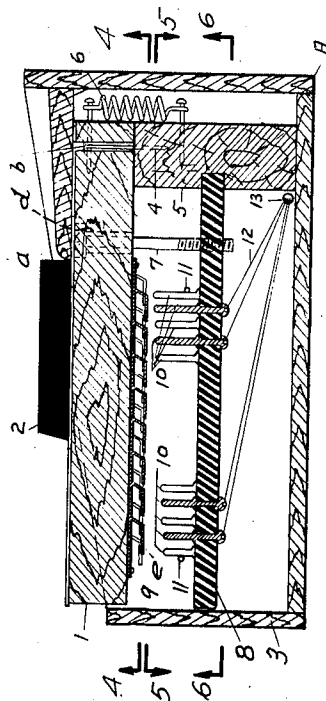
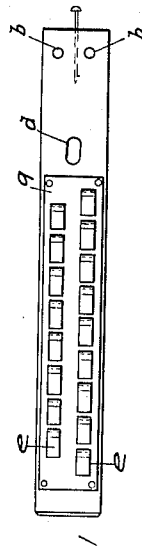
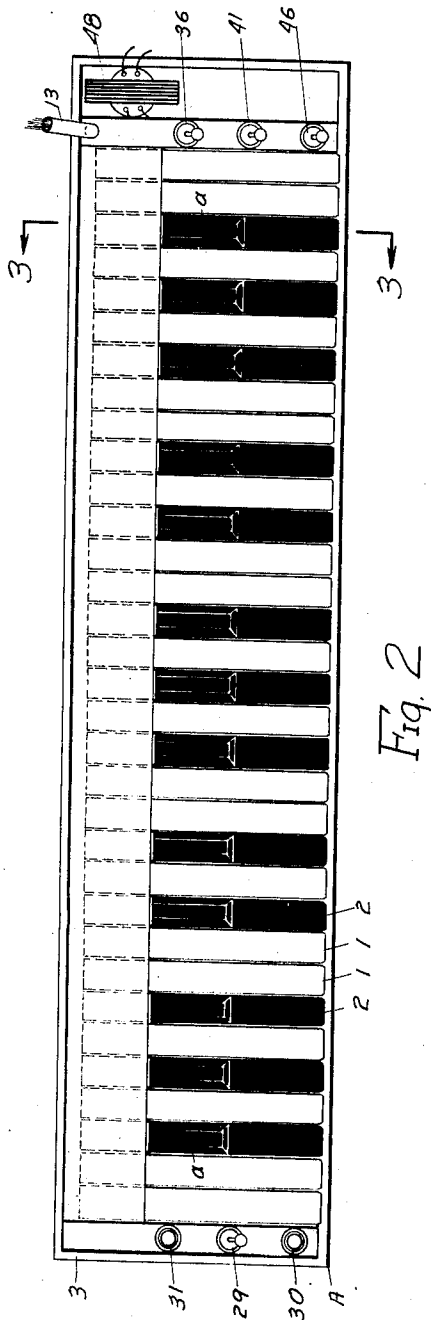
G. O. PIERCE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Filed March 20, 1939

6 Sheets-Sheet 2



INVENTOR.
Glen O. Pierce
BY: Myron J. Dickman
ATTORNEY.

Dec. 17, 1940.

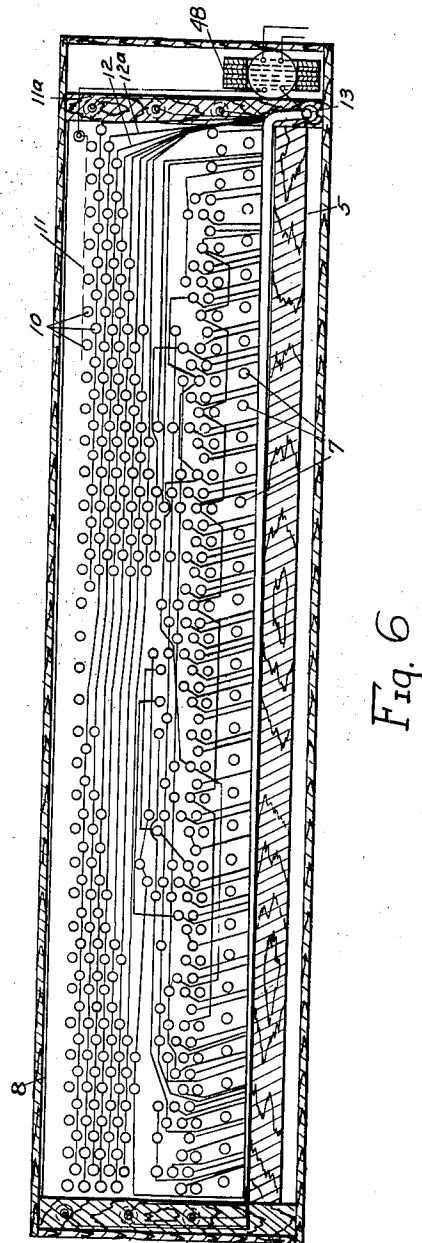
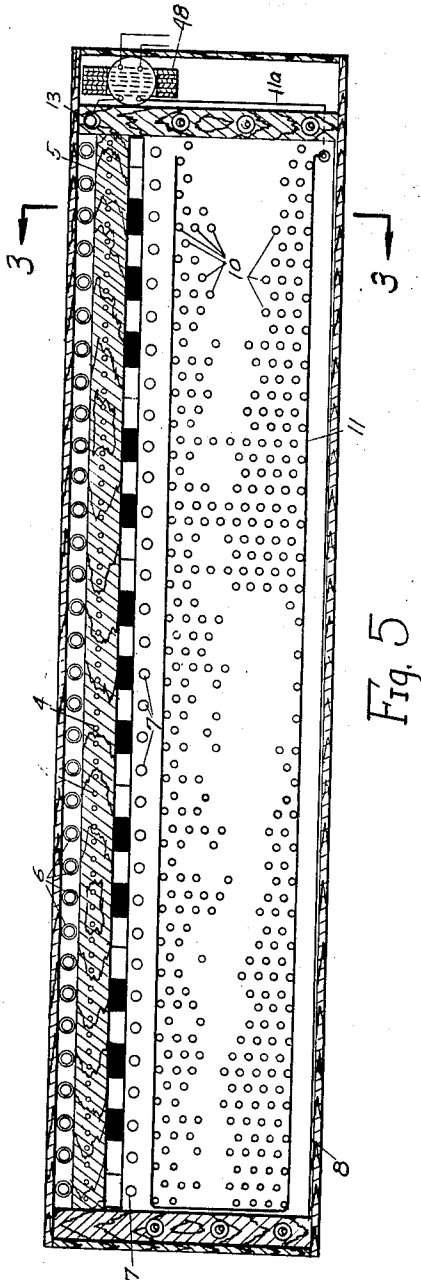
G. O. PIERCE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Filed March 20, 1939

6 Sheets-Sheet 3



INVENTOR.
BY *Glen O. Pierce*
Myron J. Dickman
ATTORNEY.

Dec. 17, 1940.

G. O. PIERCE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Filed March 20, 1939

6 Sheets-Sheet 4

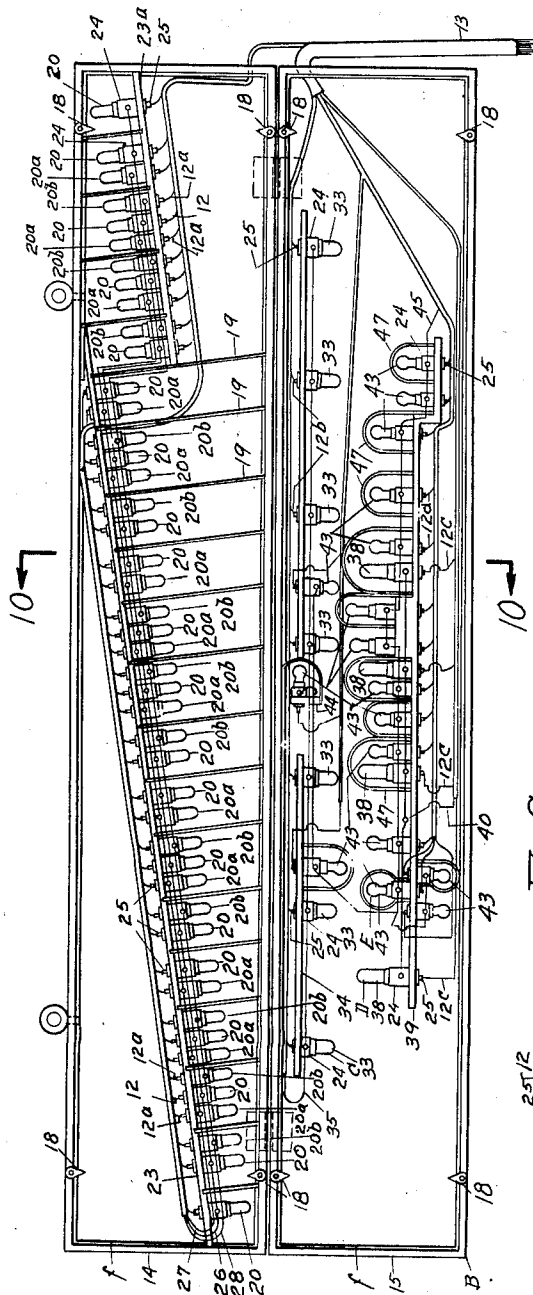


Fig. 9

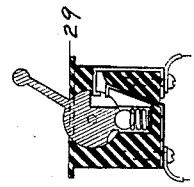


Fig. 8

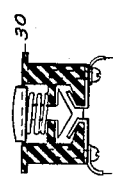


Fig. 7

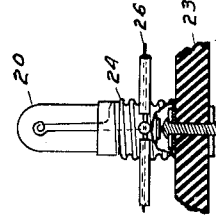


Fig. 11

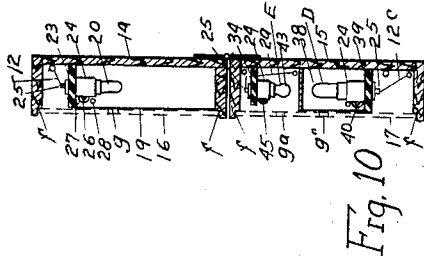


Fig. 10

INVENTOR.
BY *Glen O. Pierce*
Myron L. Dikeman
ATTORNEY.

Dec. 17, 1940.

G. O. PIERCE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Filed March 20, 1939

6 Sheets-Sheet 5

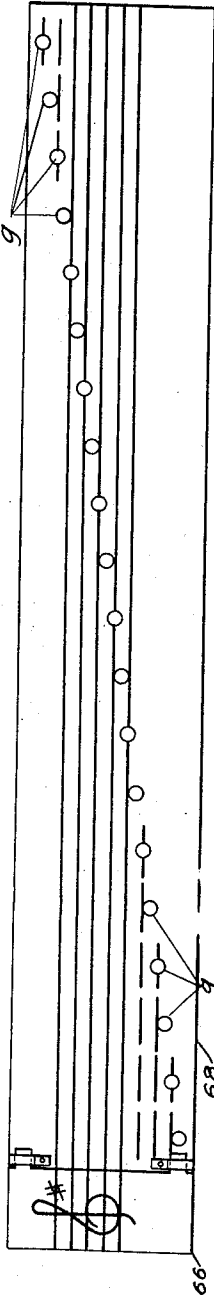


Fig. 12

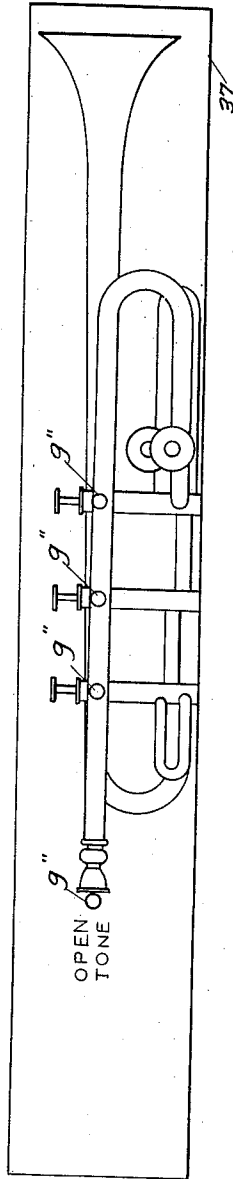


Fig. 13

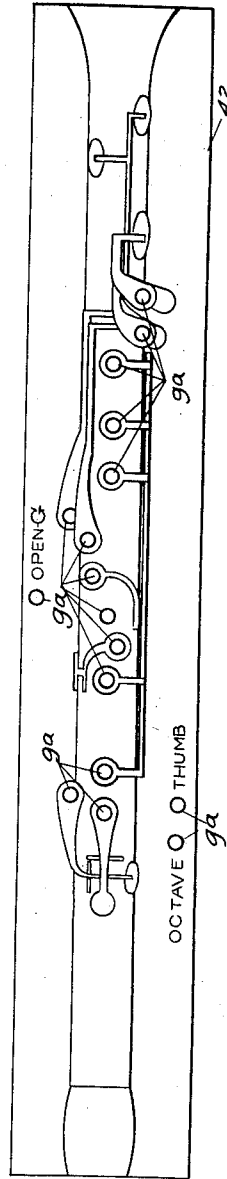


Fig. 14

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

Dec. 17, 1940.

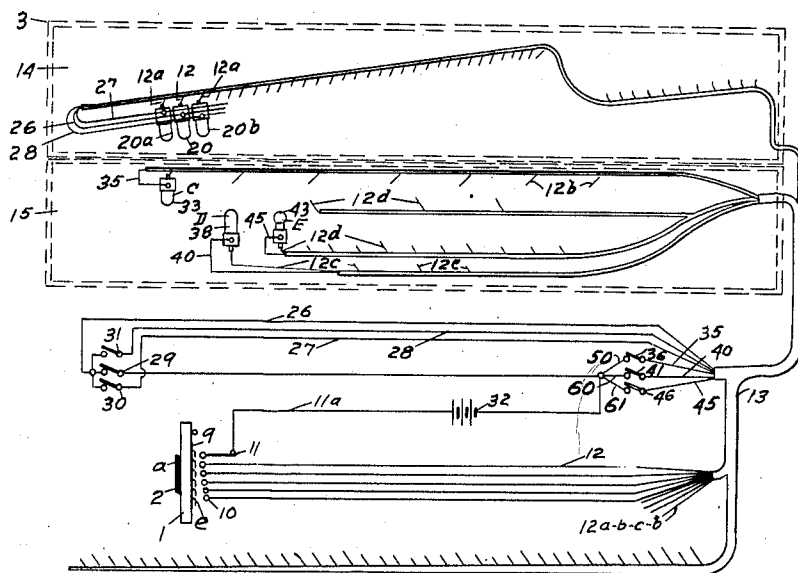
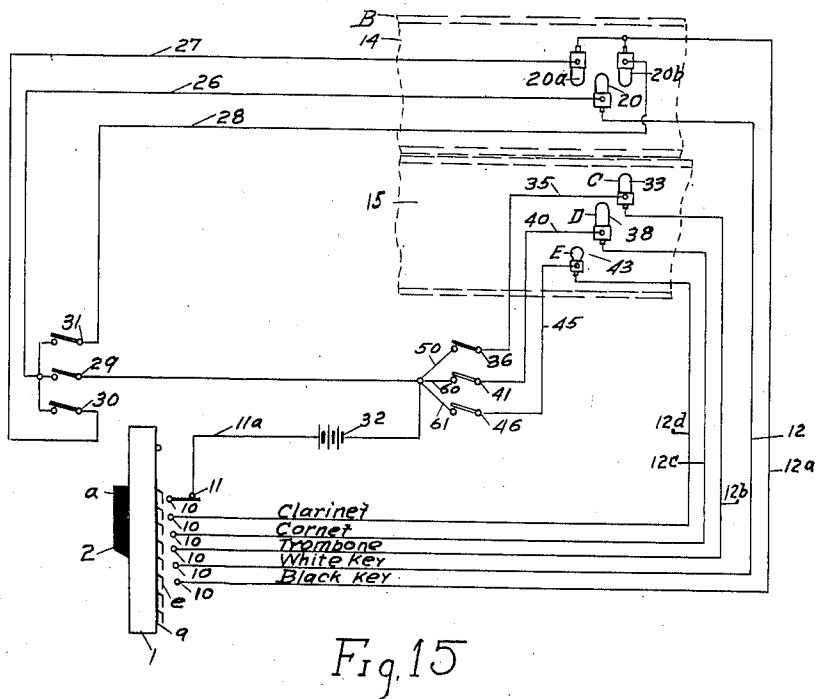
G. O. PIERCE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Filed March 20, 1939

6 Sheets-Sheet 6



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

UNITED STATES PATENT OFFICE

2,225,084

INSTRUCTION DEVICE FOR BAND INSTRUMENTS

Glen O. Pierce, Detroit, Mich.

Application March 20, 1939, Serial No. 262,832

10 Claims. (Cl. 84-477)

The object of my invention is to produce a device adapted for music instructions, applicable to various types of band instruments.

Another object is to provide a music instruction device that will indicate both the notes in music to be played, and also indicate the exact finger positions on the chosen type of instrument used.

A further object is to produce a music instruction device that may be easily converted to the different types of band instruments.

A still further object is to provide visible means for class instructions in band music, on chosen band instruments, that is simple in construction, easily and efficiently operated and that can be manufactured at a low cost.

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

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

Fig. 1 is an elevation of the assembled instrument showing the general arrangement of the various operating units, adjusted for one type of instrument instructions.

Fig. 2 is a plan view of the operating unit, showing the operating keys and control switch means therefor.

Fig. 3 is a cross-sectional view through the operating unit, taken on the line 3-3 of the Figs. 2 and 5 showing the construction of the key contacting elements.

Fig. 4 is a bottom view of one of the operating keys, taken on the line 4-4 of the Fig. 3, showing the relative positions of the various contact leaves.

Fig. 5 is a cross-sectional view lengthwise of the operating unit, taken on the line 5-5 of the Fig. 3, showing the relative position of the various key contact terminals.

Fig. 6 is also a cross-sectional view lengthwise of the operating unit, taken on the line 6-6 of the Fig. 3, showing the arrangement of the electric circuit wires as are connected to the various key contact terminals.

Fig. 7 is a vertical sectional view through a typical spring switch unit, illustrating one means for forming a momentary electric connection in certain chosen circuits.

Fig. 8 is also a vertical sectional view through a typical snap switch unit, illustrating one means for making a continued electric connection in selected circuits.

Fig. 9 is an elevation of the instruction unit, with the face boards removed, showing the gen-

eral arrangement of the various signal lights mounted therein.

Fig. 10 is a cross-sectional view of the instruction unit, taken on the line 10-10 of the Fig. 9, showing the relative position of the different assembled groups of lighting elements.

Fig. 11 is an elevation of a typical light bulb and socket, showing the connecting and insulating means therefor.

Fig. 12 is an elevation of an alternate face board, interchangeable with that shown in the upper compartment of the Fig. 1.

Figs. 13 and 14 are also alternate face boards, interchangeable with that shown in the lower compartment of the Fig. 1.

Fig. 15 is a wiring diagram illustrating the various electric circuits applicable to either a black or white operating key of the operating unit.

Fig. 16 is a wiring diagram of the assembled electric wiring cable, adapted for connecting each separated signal light, or groups of lights, with their respective operating keys, each mounted within a separated electric circuit.

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

The device as herein disclosed is especially adapted to the trumpet, or keyed type, of band instrument, and is illustrated as applied to the trombone, cornet and clarinet.

The general construction of my device comprises an operating unit having a special key board designed similar to that of the ordinary piano, and an instruction unit, or wall board, formed of dual recessed sections, each divided into various separated compartments. Each compartment contains one or more electric signal bulbs connected into a separated electric circuit leading through the respective operating unit key terminals. Instruction face boards are mounted over the respective recessed section compartments and inclosed light bulbs, designed to reflect the bulb lights therethrough and indicate, visibly, the note of music, or finger positions on the chosen type of instrument, or both simultaneously.

The operating unit A comprises a series of horizontally positioned operating keys 1 and 2 hingedly mounted within an elongated box casing 3. The keys are adjusted therein with the upper faces in horizontal alignment. The keys 50 1 are formed of elongated bars of rectangular cross-section, preferably made of wood or some suitable insulating material, and are preferably provided with white top surfaces. The keys 2 are likewise formed of similar bar sections but 55

provided with a short raised section *a* along the top central section thereof, and are preferably provided with black top surfaces. The white keys are to indicate the full tone notes, and the black keys the half tone notes commonly referred to as sharps and flats. The arrangement of the black and white keys is similar to the keys of an ordinary piano, except the black keys as herein shown are full key sections. The keys 1 and 2 are provided with small cylindrical recesses *b* extending through the inner end thereof, at right angles to the bar section, and each carries a small round headed mounting pin 4 slidably mounted therein. The pins 4 are rigidly attached or driven into a rectangular shaped support bar 5, preferably of wood and extending the full length of the box casing 3, providing horizontal support means for all of the operating keys mounted thereon. The small mounting pins 4 will spring slightly as the outer key ends are depressed, allowing the respective keys 1 and 2 to pivot over the inner edge of the support bar 5, as though hinged thereto. Hinges, or other means may be used for pivoting the keys thereon if desired. A small tension spring 6 is mounted between the inner key ends and the support bar 5 for firmly holding the keys in a horizontal position thereon. An adjusting screw 7 is loosely mounted through an elongated slot *d* formed through each key, and is threadably attached to the terminal board 3, providing means for retaining the keys in alignment. Fixedly attached to the under side of each operating key is an elongated contact plate 9, formed of suitable spring metal and provided with two rows of contact leaves *e* projected therefrom, alternately spaced. The terminal board 3 is made of suitable insulating material, positioned beneath and parallel to the line of operating keys 1 and 2, and carries mounted thereon a separate predetermined series of terminal contact pins 10 for each operating key, each contact pin being positioned to engage one of the metal contact leaves *e* of the above positioned key. At least one contact pin 10 of each key series, is connected with a common ground electric circuit wire 11 connected to some suitable electric source. Each of the remaining terminal pins 10, of each key series, is connected in a separated electric circuit by the circuit wire 12, or similar wires, leading to the same electric source. The circuit wires 12 are extended to the cable formation 13 leading to the instruction unit B and the signal light bulbs mounted therein. The depression of any of the operating keys 1 and 2 will close all of the electric circuits connected within the respective key series. Double black keys may be substituted for each key 2, if desired, for segregating the half tones in separated electric circuits.

The instruction unit B, or wall board is formed of two shallow, open, rectangular shaped sections 14 and 15, preferably hinged together at the back for more conveniently folding and packing when not in use. The case sections 14 and 15 are preferably made of wood, or some similar suitable material, and are formed with recessed open edges *f* for receiving suitable instruction face boards 16 and 17 therein, and retained in position by suitable clip means 18, or similar units. The face board 16, of the upper case section 14, is designed to represent the music staff, illustrated in Fig. 1 in the bass clef, indicating the various full tone notes, arranged in order of the music tone scale, each full note

being represented by a circular light opening *g* in its proper staff position, and extended through the face board material. The face board 17 of the lower case section 15, is provided with a picture of the chosen band instrument as may be selected for instructions, showing the respective keys or tone positions, and is herein illustrated in Fig. 1 as the trombone. Each key, or tone position of the instrument is also indicated by circular light openings *g'* formed through the face board material, as in the former case. The face board 16 is provided with a detachable clef signature card 65, interchangeable with the signature card 66, of Fig. 12, when desired.

Within the upper case section 14 are mounted various separated series of small electric signal light bulbs, one series for each full tone, or white, operating key 1 of the operating unit. Each series, or group of signal light bulbs, represent both the full and half tone notes applicable to its respective white key, and are preferably distinguished by a white light bulb 20 for the full tone notes, a red light bulb 20*a* for a half tone flat, and a green light bulb 20*b* for a half tone sharp, or with various other color combinations. The different series, or groups, of signal light bulbs are separated from each other by thin opaque partitions 19 fixedly mounted within the case section 14, and are positioned symmetrically opposite the corresponding note light opening *g* of the face board 16, so that the light from any one bulb of the series will reflect therethrough and indicate the note on the staff corresponding to any chosen operating key 1 or 2 when same is depressed. This is accomplished by connecting the signal light bulbs 20, 20*a*, or 20*b*, one or more as the case may be for each series, in separated electric circuits by the circuit wires 12 and 12*a* or similar wires, leading to the corresponding operating key terminal pins 10, as shown in Fig. 15. The respective separated circuits are completed through separated ground circuit wires 26, 27 and 28, each wire being a common ground for all bulbs of the same class, as the bulbs 20, the bulbs 20*a*, and the bulbs 20*b*, as indicated in the Fig. 9 of the drawings. Each of said ground circuit wires lead to separate switch units 29, 30 and 31 of the operating unit A, thence to a common electric source, herein illustrated as a battery unit 32. The opposite battery terminal is connected with the common ground terminal wire 11, by the circuit wire 11*a*, which is attached to the outer contact pins 10 of each operating key series, all as illustrated in the special key wiring diagram shown in Fig. 15 of the drawings. The light bulbs are mounted on fixed insulating bars 23 and 23*a*, by metal bulb sockets 24 and insulated terminal rivets 25, as shown in Fig. 11.

The switch unit 29 is of the snap type, remaining closed when set as illustrated in Fig. 8, and when closed will light the bulbs 20, of any series, whenever the corresponding white operating key 1 is depressed sufficiently to close the contact terminals mounted therebeneath. The switch units 30 and 31 are of the spring type as illustrated in Fig. 7, and are momentarily closable, manually, by the operator, and will light the bulbs 20*a* or 20*b* of any series whenever the corresponding black 2 of the operating unit is depressed. This allows the operator to select either flats or sharps as desired, and so indicated by either the red or green light rays reflected through the corresponding staff opening *g*. When the switch unit 29 is open, all signal light bulbs

of the music staff compartment will be inoperative. If double black keys are used for the keys 2, the units 30 and 31 may be omitted.

Within the lower case section 15 are also 5 mounted various series of electric signal light bulbs, and for more clearly describing same they are separated into three groups C, D, and E, and herein illustrated as being applicable to the trombone, cornet, and clarinet instruments respectively, and as indicated in the special key wiring diagram shown in the Fig. 15. The group C, for the 10 trombone comprises seven single light bulbs 33, arranged in horizontal alignment along the upper portion of the case section 15, said bulbs being 15 mounted on a fixed insulating bar 34, by means of the special metal sockets 24 and insulated terminal rivets 25 as in the former case, and as shown in the Fig. 11. The light bulbs 33 are spaced to indicate the various tone positions of 20 the trombone slide as are required for different note tones, and are positioned directly opposite the circular light openings *g'* of the face board 17, illustrated in the Fig. 1, so that the light rays will reflect therethrough for indicating the trombone slide position, for each desired note as may 25 be selected on the operating keys 1 or 2. An illustrated form of the instrument shown across the face board 17 clearly identifies the respective slide positions. The synchronized lighting is accomplished by connecting each signal light bulb 33 30 into a separate electric circuit, by electric circuit wires 12b, or similar wires, the same preferably being soldered to the respective terminals as indicated in the Fig. 11, and each wire leading 35 to an operating key terminal pin 10 located beneath the corresponding operating key 1 or 2, as indicated in the Fig. 15. The electric circuits for all of the light bulbs 33 are completed through a common ground wire 35, attached thereto by 40 means of solder, or other suitable means, and leads through the snap switch 36 of the operating unit A. The detail of the switch unit is illustrated in Fig. 8. The switch 36 is connected to the electric source, here illustrated as a battery 45 32, by the circuit wire 50, the opposite battery terminal being connected to the common terminal ground wire 11 of the operating unit A by the circuit wire 11a. When the switch 36 is closed, any signal light 33 will be lighted whenever the 50 corresponding operating key 1 or 2 is sufficiently depressed, and thereby indicating the trombone slide position for that note. Whenever the same slide position is used for producing different tones, its respective light circuit wire 12, or similar connecting circuit wire, is extended along the 55 terminal board 8, preferably in parallel alignment, and is connected to various terminal pins 10 beneath the different operating keys 1 and 2 corresponding to that position, and as indicated 60 in the Fig. 6 of the drawings.

When the device is used for instructions of the cornet instrument, the face board 17 as shown in the Fig. 1 is interchanged with the alternate face board 37 shown in detail in Fig. 13, and which 65 is provided with a diagram of the corner instrument across the face thereof, showing the various key positions, each illustrated by a circular light opening *g''* formed therethrough, including the mouth piece for indicating open tones or notes. 70 The face board 16 is replaced by the staff 68, of Fig. 12. The lighting group D for the cornet comprises four single signal light bulbs 38, also arranged in horizontal alignment along the central portion of the case section 15, said bulbs being 75 ing mounted on the fixed insulating bar 39 by

the special metal sockets 24 and insulated terminal rivets 25, as in the former case, and as illustrated in the Fig. 11. The several light bulbs 38 are spaced and positioned directly opposite the 5 light openings *g''* of the face board 37, so as to reflect light rays therethrough for indicating the key, or keys, to be actuated for any desired note selected by the operating key 1 or 2. Like in the former case, this is affected by connecting each 10 of the signal light bulbs in separated electric circuits, by the circuit wires 12c, or similar circuit wires, each of said wires leading to one or more operating key terminal pins 10 located beneath the corresponding key, or keys 1 and 2, and as 15 indicated in the Fig. 15. The electric circuit for all bulbs 38 is completed through a common ground wire 40, attached thereto as indicated in Fig. 11, and is extended through the snap switch 41, illustrated in the Fig. 8, and thence to the common electric source indicated as a battery 20 32 by the circuit wire 60. The battery 32 has its opposite terminal connected to the common ground terminal wire 11 as outlined in the former case, for closing all circuits with their respective key terminals. When the switch 41 is closed, and the 25 switch 36 opened, the respective signal bulbs 38 will be lighted whenever the corresponding operating key 1 or 2 is depressed. Inasmuch as the notes or tones from a cornet are produced through either open valves, or by one or more 30 valves being actuated simultaneously, it therefore may require one or more signal lights simultaneously for each annunciation on the instruction unit face board 37. This may be accomplished as in the former case, by extending each of the 35 connecting circuit wires 12c, or similar connecting wires along the terminal board 8, preferably parallel therewith, and making the proper electric connections of the various required wires to the various key terminal pins 10 corresponding to the 40 respective different operating keys 1 and 2 requiring such light, or lights in series, for indicating the various instrument valve positions for producing that tone. This multiple wire connection is fully illustrated in the Fig. 6 of the draw- 45 ings. The bulb group D may be used either with or without the music staff lights of the case section 14, as desired, by actuating the control switch 29 of the operating unit.

To adjust the instrument for clarinet instructions, the face board 17 as shown in Fig. 1 is 50 interchanged with the alternate face board 42 shown in the Fig. 14. The face board 42 is provided with an illustration of a clarinet instrument thereon, indicating the correct key and 55 valve location of the standard type of instrument, each key, or valve operating means is indicated by a circular light opening *ga* formed therethrough. The face board 16 is replaced by the staff 68, in Fig. 12. The light bulb group E, 60 for the clarinet, and as herein illustrated, comprises seventeen light bulbs 43, although more or less bulbs may be required for the different types or grades of clarinet instruments. The light bulbs 43 are located in various positions 65 throughout the upper, central, and lower sections of the case unit 15, and are mounted therein on the fixed insulating bars 34, 39, and 44, by means of the special metal sockets 24 and insulated terminal rivets 25 as heretofore described. The 70 general arrangement is more fully illustrated in the Fig. 9. Each of said signal light bulbs is positioned directly opposite one of the light openings *ga* of the face board 42 so as to reflect the light rays therethrough for indicating the instru- 75

ment key or keys to be actuated for producing the desired note tone selected on the operating keys 1 and 2. Like in the former case for the group D, each signal light bulb 43 is connected in a separated electric circuit by different electric circuit wires 12d, or similar wires, and each of said wires leading to one or more operating key terminal pins 10 located beneath the corresponding operating keys 1 and 2, as indicated in the Fig. 15. The electric circuit for all of the signal bulbs 43 is completed through the common ground wire 45 attached to each bulb, and extended through the snap switch 46 thence to the battery 32, by the circuit wire 61. The opposite battery terminal is connected to the common ground terminal wire 11 as in the former case. When the switch 46 is closed, and switches 36 and 41 are open, the respective signal light bulbs, or series of bulbs 43, will be lighted whenever the corresponding operating key 1 or 2 is sufficiently depressed to connect the corresponding terminals mounted therebeneath. Like the cornet, the clarinet also requires one or more keys to be actuated for producing the different note tones, and thus requires either a single light bulb or a series of light bulbs simultaneously reflected to indicate the respective key positions for any chosen tone as may be selected by the operating key 1 or 2. This single or multiple lighting is effected as in the previous case, by extending the various electric circuit wires 12d, or similar wires, along the terminal board 8 and making proper connections of the various required wires to each operating key terminal pin 10, corresponding to the operating key, or keys, requiring such light, or lights in series therewith, and as previously described.

The group E may be used with or without the music staff lights, as described in the former case.

In all groups C, D, and E, where more than one bulb is lighted simultaneously, such bulbs are separated from each other by thin partitions 47 fixedly mounted within the case section. The completed wiring of the entire device is effected by use of a special cable 13, inclosing the various groups of wires in a single unit, as illustrated in Fig. 16. The electric current may be changed to any A. C. circuit by the use of a proper transformer 48 connected within the circuit, as shown in Figs. 1 and 2. The operation is the same.

My device may be modified to various types of band instruments, especially of the trumpet class.

It is therefore apparent that my device is subject to various modifications in arrangement, design and application without departing from the spirit of my invention, and I therefore claim not only the structure herein illustrated but any modification thereof that is substantially a substitution of parts and sections herein shown.

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

1. An instruction device for band instruments, comprising an operating unit provided with movable keys representing the various tones of the music scale, a dual compartment instruction unit formed with front panel sections thereover, each designed with a replica of the chosen instrument with keys, and of the corresponding music staff, across their respective front panel sections, electric means provided thereon for indicating the positions of the instrument keys and the music staff notes, means for connecting each indicating

electric means of said key and note positions, electrically, with the corresponding keys of the operating unit in a manner capable of producing visible signals for each note and key represented on the instruction unit, whenever the corresponding key of the operating unit is depressed.

2. An instruction device for band instruments comprising an operating unit formed with a series of horizontally arranged keys representing the various tones of the music scale, electric terminal switch closing means provided for each operating key and actuated thereby, a dual compartment instruction unit formed with face panel sections mounted thereover, said face panels being designed with a replica of a band instrument with keys and of the corresponding music staff across their respective faces, electric signal means mounted opposite each instrument key and staff note position within the respective compartments, means for connecting each electric signal means, electrically, with the terminal switch closing means of the corresponding key of the operating unit, and in a manner for producing a visible signal for each instrument key and staff note position whenever its corresponding operating key is depressed.

3. An instruction device for band instruments comprising an operating unit formed with a series of operating keys representing the different tones of the music scale, and arranged in similar order of a piano key board, separate electric terminal closing switch units mounted beneath each operating key and actuated thereby, a dual compartment instruction unit formed with detachable face panels designed with a replica of a chosen band instrument with keys and of the corresponding music staff across their respective outer faces, each instrument key and staff note position being indicated by small openings formed therethrough, an electric signal unit installed opposite each instrument key and staff note position opening, circuit wires for connecting each signal unit, electrically, with the respective terminal closing switch unit of the corresponding key of the operating unit, and in a manner for producing visible signals for each note and instrument key position whenever the corresponding operating key is depressed, means for connecting each of said signal units circuits with a common electric current source, and an opening switch unit mounted within the various signal circuits leading to the music staff section.

4. An instruction device for band instruments comprising an operating unit formed of a series of operating keys representing the full and half tones of the music scale, arranged in order similar to the piano key board, separated electric terminal switch elements mounted beneath each operating key and actuated thereby, a dual compartment instruction unit provided with detachable face panels mounted thereon, said face panels being designed with a replica of a band instrument with keys and of the corresponding music staff across their respective panel faces, each instrument key and staff note position being indicated by small light openings formed therethrough, one or more electric signal light units mounted beneath the respective panel light openings, circuit wires for connecting each electric signal light unit, electrically, in separated electric circuits leading through the terminal switch elements of the corresponding key, or keys, of the operating unit, and in a manner for producing visible lights through their respective panel openings for each full or half tone note and instru-

ment key position, whenever the corresponding key of the operating unit is depressed, and means for connecting each of said light signal circuits with a common electric current source.

5. An instruction device for band instruments comprising an operating unit formed of a series of different colored operating keys representing the full and half tones of the music scale, arranged in order similar to the piano key board, closable electric switch terminals mounted beneath each operating key and actuated thereby, a compartment instruction unit separated in adjacent instrument and music staff sections, each being provided with a detachable front face panel mounted thereon, said face panels being designed with a replica of a chosen band instrument with keys and of the corresponding music staff across their respective faces, each instrument key and staff note position being indicated by small light openings formed therethrough, plain electric signal light units mounted within each section positioned one opposite each face panel light opening for indicating the instrument key and full tone note positions of their respective sections, one or more additional different colored electric signal light units mounted adjacent various full tone signal light units of the music staff section, for indicating half tone notes incident thereto, circuit wires for connecting each of said electric signal light units into separate electric circuits leading to one or more of the switch terminal units mounted beneath the corresponding key or keys of the operating unit, and in a manner for producing visible light signals in both compartment sections for chosen note and key positions whenever the corresponding operating key is depressed, momentary switch units connected within each colored signal light unit circuit, and an electric current source connected within each of said circuits.

6. An instruction device for band instruments comprising an operating unit formed of a series of white and black keys representing full and half tones of the music scale, arranged in order similar to the piano key board, adjusting means provided for each operating key, spring means connected to each operating key for firmly restraining them in their adjusted positions, a pre-determined series of closable electric circuit switch terminals mounted beneath each operating key and actuated thereby, a recessed case instruction unit separated into adjacent instrument and music staff sections and with the latter music staff section being sub-divided into small separated compartments, one for each white, full tone operating key of the operating unit, a detachable face panel mounted over each case section, interchangeable for different similar panels, said panels being designed with a replica of different types of band instruments with keys and music staff across their respective faces, each key and instrument note position being indicated by small light openings formed therethrough, a plain electric signal light unit mounted opposite each panel light opening within each case section, the signal light units in the instrument section being separated into groups, one group for each type of band instrument, one or more additional different colored signal light units mounted adjacent various music staff full tone signal light units within its respective separated compartment for indicating the sharp and flat half tones incident thereto, electric circuit wires for connecting each of said signal light units, electrically, into separated electric circuits

leading to one or more of the switch terminal units mounted beneath the corresponding operating key or keys of the operating unit, and in a manner for producing visible light signals indicating full and half tone notes and corresponding instrument key positions whenever a chosen operating key is depressed, means for connecting each signal light circuit within a common electric current source, a momentary switch unit mounted within each colored signal light circuit, and a closable switch unit mounted in each group of signal light circuits installed within the instrument case section.

7. An operating key board unit to be used in combination with a dual band instrument and music staff instruction unit, of the electric signal light type, comprising a suitable casing, a series of horizontally positioned white and black operating keys pivotally mounted therein representing full and half tones of the music scale, key adjusting means mounted within the casing for properly aligning said keys, spring means attached to each key for restraining it firmly in its adjusted position, a pre-determined series of closable electric circuit switch terminal units mounted beneath each operating key and actuated thereby, means provided for connecting each key switch terminal unit in a separated electric circuit leading to the various instruction unit signal lights, momentary switch units mounted on the casing for connecting in and regulating the half tone signal light circuits, and closable switch units mounted on said casing for connecting in various other instrument unit signal light circuits for separating them into pre-determined groups.

8. An operating key unit to be used in combination with a dual band instruction unit of the electric light type, comprising a suitable casing, a series of white and black operating keys pivotally mounted therein representing the full and half tones of the music scale, said keys being arranged in order similar to a piano key board, screw adjusting means mounted in the casing for adjusting said keys in true alignment, spring means attached to each key for firmly restraining same in its adjusted position, a metal contact plate formed with a series of projected contact leaves, mounted on the bottom of each operating key, a pre-determined series of terminal contact pins mounted beneath each operating key, each positioned beneath one of the said contact plate leaves, and closable therewith whenever the corresponding key is depressed thereon, said contact pins being insulated from each other, means for connecting said contact plate and various terminal pins within separated electric circuits leading to the various instruction unit signal lights, momentary pressure switch units mounted on the casing for connecting in and regulating the various half tone signal light circuits, and closable switch units mounted on said casing for connecting in and separating various other instrument key signal light circuits in pre-determined groups.

9. An instruction unit for band instruments, to be used in combination with a key operating unit designed to represent full and half tones of the music scale and provided with key electric circuit closing switch means, comprising a suitable compartment casing separated into two adjacent instrument and music staff sections, each section being provided with a detachable face panel mounted on the front side thereof, said face panels being designed with a replica of chosen band instruments with keys and corresponding music staff across their respective faces, each in-

- strument key and staff note position being indicated by a small light opening formed therethrough, plain electric signal light units mounted within each section, positioned one opposite each
- 5 face panel light opening, for indicating instrument key and full tone note positions respectively, one or more additional different colored signal light units mounted adjacent various full tone signal light units of the music staff section,
- 10 to indicate the half tone notes incident thereto, electric circuit wires for connecting each of the said signal light units, electrically, in separated electric circuits leading to one or more circuit closing switch means of the key operating unit,
- 15 and a momentary pressure switch unit for connecting in and controlling the half tone signal light circuits.
10. An instruction unit for band instruments to be used in combination with a key operating
- 20 unit designed to represent full and half tones of the music scale and provided with separated key operated electric switch units, comprising a suitable compartment casing separated into two adjacent instrument and music staff sections, each
- 25 compartment being provided with a detachable

face panel, interchangeable for different similar panels, designed with a replica of different types of band instruments or corresponding music staff across the respective faces thereof, each instrument key and staff note position being indicated

5 by a small light opening formed therethrough, a plain electric signal light unit mounted opposite each panel light opening within each case section for indicating the respective instrument key and full tone note positions, one or more additional

10 different colored electric signal units mounted adjacent various staff full tone signal light units for indicating the sharp and flat half tones incident thereto, electric circuit wires for connecting

15 each of said signal light units, electrically, into separated electric circuits leading to one or more operating key switch units, the various instrument circuits of the instrument section being separated into groups, one group for each type of

20 band instrument included, momentary pressure switch units for connecting in and regulating said half tone colored light circuits, and closable switch units provided for the different groups of signal circuits within the instrument section.

GLEN O. PIERCE. 25