May 8, 1928. 1,669,117

R. H. BEERS

ELECTRICAL DISPLAY FOR STRINGED MUSICAL INSTRUMENTS

Filed Oct. 26. 1926 2 Sheets-Sheet 1

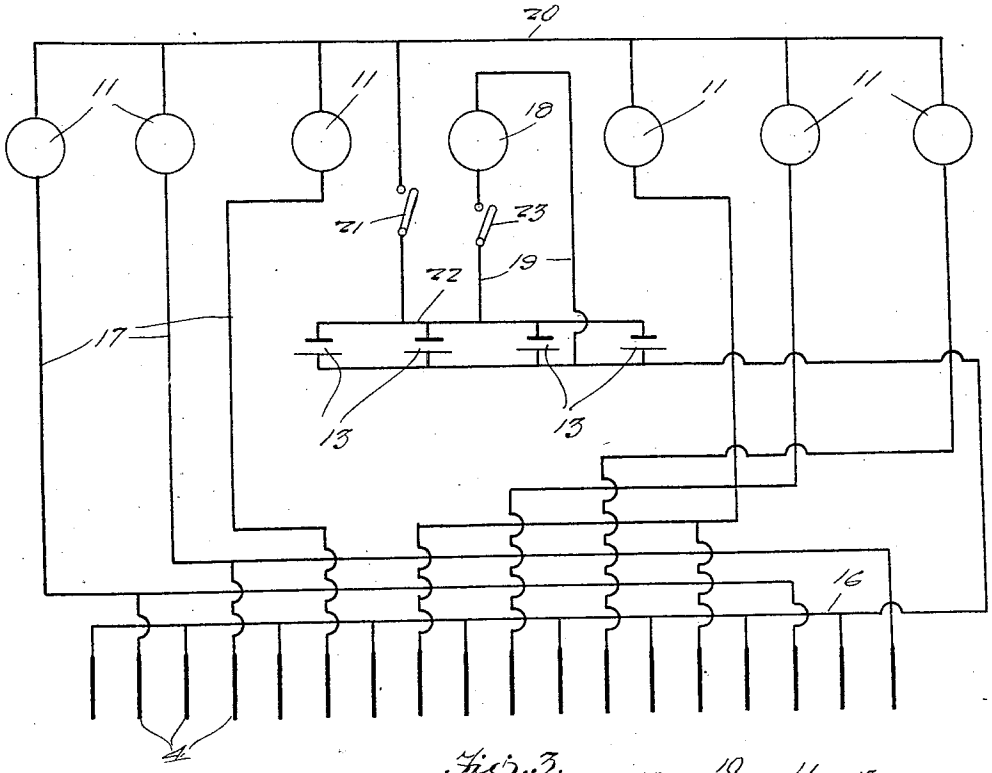


Fig. 3.

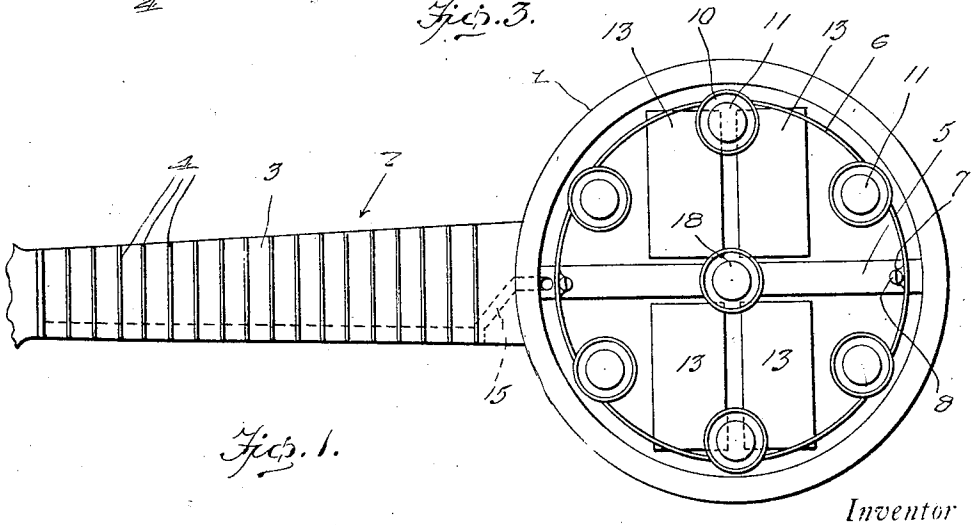


Fig. 1.

Inventor
Randal H. Beers

By Clarence A. O'Brien

Attorney

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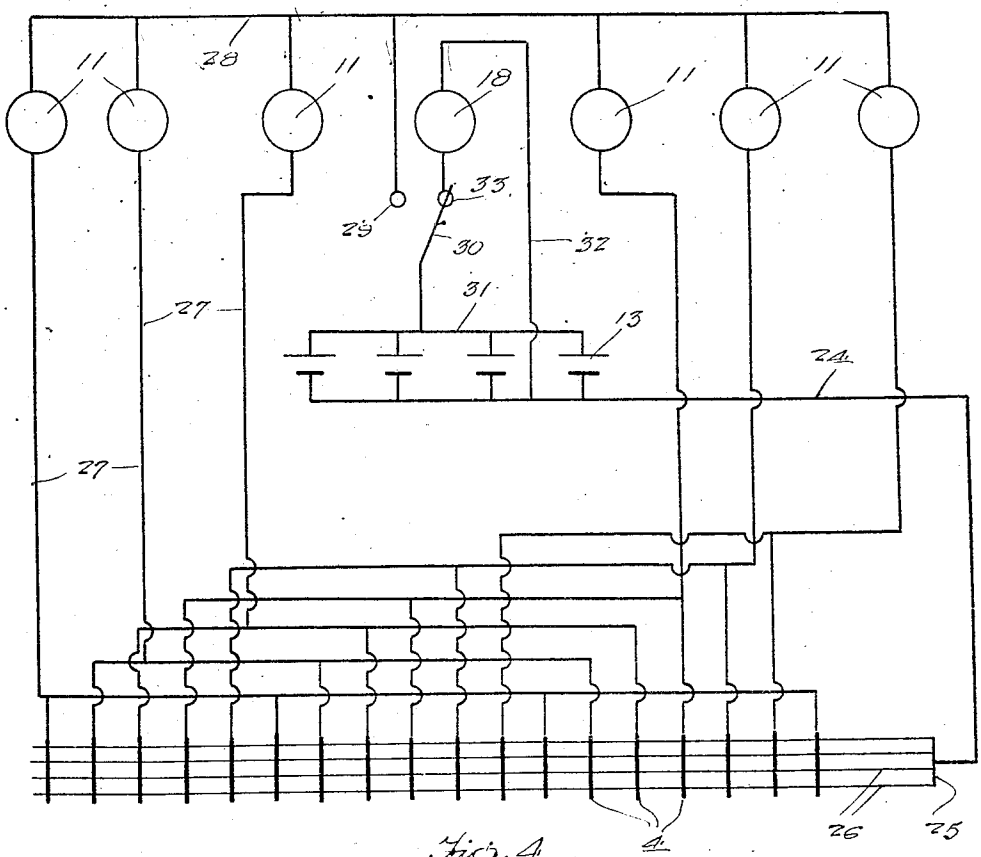
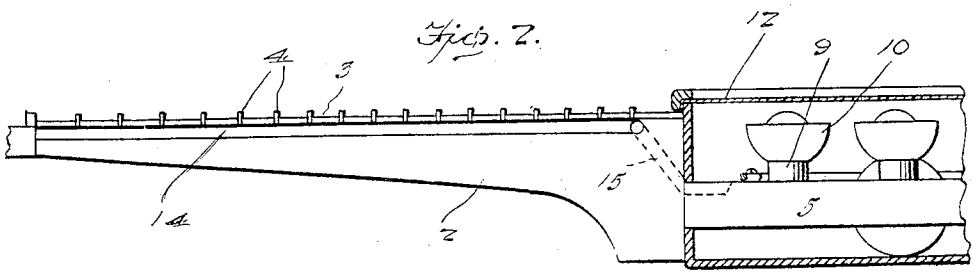


Fig. 4.

Fig. 2.



Inventor
Randal H Beers
By Clarence O'Brien
Attorney

Patented May 8, 1928. 1,669,117

UNITED STATES PATENT OFFICE.

RANDAL H. BEERS, OF EAST ORANGE, NEW JERSEY.

ELECTRICAL DISPLAY FOR STRINGED MUSICAL INSTRUMENTS.

Application filed October 26, 1926. Serial No. 144,296.

This invention relates to improvements in musical instruments and particularly to stringed musical instruments having electrical display means associated therewith.

An object of the invention resides in providing the combination of electrically operated display means with a stringed musical instrument in which the frets or other means that may be provided, and strings are constructed for cooperation in the playing of the instrument for providing circuit controlling means to the electrical display device for variably operating said display device with the instrument to produce novel effects with the production of music by the electrical display device.

The invention further comprehends the provision of suitable illuminating means adapted to be applied in an instrument having a semi-transparent head and sound box such as a banjo, mandolin, or ukulele, in which suitable illuminating means of varying color may be mounted in the head or any other part of the instrument or elsewhere, as desired, and through predetermined circuit connections with the frets and strings of the instrument, control of the illuminating means is thus obtained for producing novel color combinations for illuminating the head or other parts of this instrument or any other display as desired in the operation of the instrument in the usual manner.

The invention comprehends numerous other objects residing in the manner of carrying out the invention including the construction and relation of the elements which are more particularly pointed out in the following description and claim, directed to a preferred form of the invention, it being understood, however, that various changes in the size, shape and arrangement of parts may be made without departing from the spirit and scope of the invention as herein set forth.

In the drawings forming part of this application:—

Figure 1 is a plan view of a banjo ukulele having the strings and head cover removed, and illustrating one form of mounting the light and supporting structure in the head of the instrument.

Figure 2 is a vertical longitudinal section through the structure shown in Figure 1.

Figure 3 is a wiring diagram showing one method of electrically connecting the frets, light, and a source of power for operating the lights or other apparatus during the playing of the instrument.

Figure 4 is a wiring diagram showing different circuit combinations from obtaining similar results from that shown in Figure 3.

In the drawings, 1 indicates the head member of cylindrical form of a banjo ukulele or the like, to which the neck member 2 is secured carrying the keyboard 3 on which are mounted a plurality of metal bars forming frets indicated at 4 in a manner well known in the art. Bar members 5 extend diametrically across the head 1 in line with the neck 2 as clearly shown in Figure 1, and rise wholly within the head of the instrument as illustrated in Figure 2, providing a suitable support for the supporting ring member 6 provided at diametrically opposite points with eyes 7 to receive the mounting screws 8 or the like which are engaged in the cross bar 5.

Suitable sleeve members 9 are secured circumferentially within and to the ring 6 as shown in Figure 1 and lie in substantially equal spaced relation with respect to one another. These sleeve members at the upper ends are formed with reflectors 10. The sleeves 9 are adapted to receive suitable lamp sockets for electric lamps 11 of any well known type now used in the art.

It will be seen that upon illumination of the lamps 11, with the reflectors 10 reflecting the light upwardly will project the same to the diaphragm 12 secured to the upper end of the head 1 and which is usually formed of semi-transparent material of a character well known in the art and commonly used with instruments of the type heretofore mentioned.

The numeral 13 indicates a plurality of batteries such as dry cells commonly used in the art adapted for supplying power to illuminate the lights 11 while in the neck 2 of the instrument is formed directly under the finger board 3 and at one side or other convenient place thereof with a channel 14 extending throughout the length of the finger board and communicating at 15 as shown in Figures 1 and 2, which communicate with the interior of the drum 1 and serves to re-

ceive and form a conduit for the circuit wires connecting the frets, the lamps and the dry cells 13, or other sources of electric current.

Referring particularly to Figure 3, illustrating one form of electrical connection contemplated by the present invention, circuit connection is made through the wire 16, with one terminal of each of the batteries 13 and alternating frets 4 or other means that may be provided on the finger-board 3. Each lamp 11 is mounted on the ring 6 and is electrically connected by an independent circuit connection 17 with one or more frets 4 or other means that may be provided on the finger-board of the instrument, while light or lamp 18 in the central portion of the cross bar 5 is provided with circuit connections 19 from its opposite terminals to the opposite terminals of the battery 13.

The return connection for the lamps 11 are electrically connected to the return conductor 20 which is mounted in the control switch 21 and in turn connected to the opposite terminals of the battery 13 as indicated at 22.

Steel strings are used so that in the playing of the instrument the engagement of the steel wires with the frets 4 closes the circuit between adjacent frets through predetermined lamps 11 in accordance with the arrangement of circuit connections with said lamps, such as shown in Figure 3, so as to illuminate certain of each for each note played on the instrument and automatically when the switch 21 is closed. These lamps may be colored and as a result of playing the instrument closing the circuit to one or more lamps, will produce a novel effect in the illumination of the instrument or other object, making the same highly useful for display and novelty purposes.

A suitable circuit controller 23 may be closed to close the circuit through the lamp 18 through wires 19 so that illumination of the diaphragm 12 may be obtained continuously when desired, in addition to the intermittent illumination of the diaphragm by the energization of the circuit to the lamps 11 independently of one another in the playing of the instrument through the bridging of a pair of adjacent frets in the finger-board of the instrument.

A circuit arrangement may be used such as shown in Figure 4 to replace that shown in Figure 3, if desired, in which the circuit with one terminal of the battery 13 is formed through wire 24 which extends and is provided with a common connection at 25 to the instrument strings 26. The lamps 11 are each connected by independent circuit connections 27 with a plurality of spaced frets 4 on the finger-board 3, the strings 26 and the frets forming a control circuit for the lamps 11.

The opposite terminals of the lamps 11 are connected to the common conductor 28 extending to the terminal 29 so that by proper position of the switch 30, the circuit may be made with the opposite terminals of the battery 13 through the wires 31. The lamp 19 is shown in an independent circuit 32 controlled by the switch 30 to close the circuit when engaged with the contact point 33 in order to maintain the lamp 18 illuminated for illuminating the diaphragm.

With this arrangement of circuit connections as shown in Figure 4, different combinations of light effects may be obtained from that shown in Figure 3, and lamp 18 can only be continuously energized when the circuit to the remaining lamps 11 is broken through the switch 30. The switches 21, 23 and 30 may be mounted on any suitable portion of the instrument that may be of any suitable size or design adapted for the purpose.

Where electric power circuits such as the lighting circuits provided in cities for house lighting purposes are available, it is preferable to use the current from such circuits instead of the batteries 13 mounted in the instrument, and for this purpose the instruments are preferably provided with suitable socket structures of any desired type now used in the art which are indicated diagrammatically at 35 in Figures 3 and 4 for the reception of a suitable plug connection suitably attached to the circuit wires from the house lighting circuit or other power circuit which may be accessible. Suitable switches 36 are also mounted on the instrument in order that the power circuit when connected with the instrument may be suitably controlled.

It will thus be apparent from the above description that a new combination has been provided in the construction of the musical instrument, set forth, in which the strings and finger board perform a new function, that of controlling electrical circuit connections of a predetermined character for closing a plurality of independent electric circuits adapted to include illuminating means if desired, for producing novel scenic effects on any portion of the instrument or other objects.

Having thus described my invention, what I claim as new is:—

In combination, a stringed musical instrument formed with a head member and a neck extending therefrom and provided with a finger board having a plurality of spaced frets, said head member having a covering of semi-transparent material at one side thereof, a bar member disposed diametrically within the head member beneath said covering, a ring member attached to the bar, said bar and ring members providing a support for a plurality of electric

light sockets disposed immediately beneath the covering within which to mount the bulbs and reflectors for directing the light therefrom against the side of the covering and an electric circuit arranged in the instrument including a source of current disposed in the head member and circuit controlling contact members engageable by said fret and associated with said bulb in a predetermined relation and operable through the movement of the fret for closing the circuit.

In testimony whereof I affix my signature.

RANDAL H. BEERS.