

April 27, 1937.

A. J. STIMSON

2,078,350

ELECTROPHONIC STRINGED INSTRUMENT

Filed Jan. 19, 1934

Fig. 1

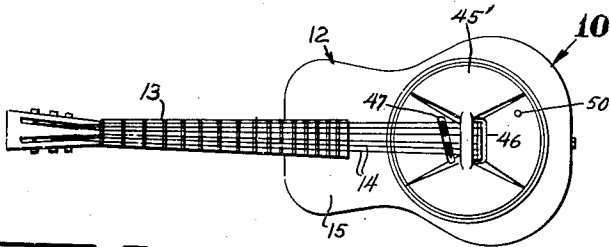


Fig. 2

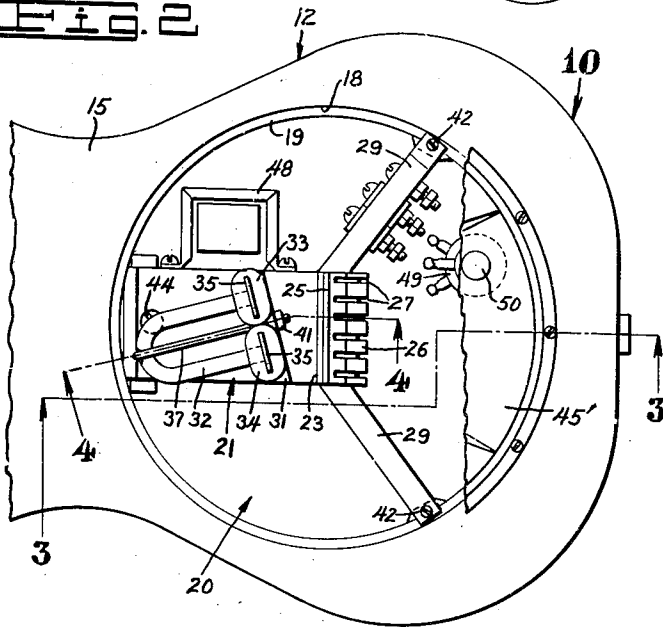


Fig. 3

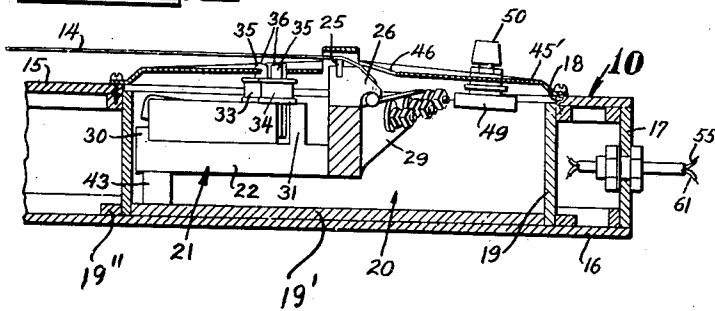


Fig. 4

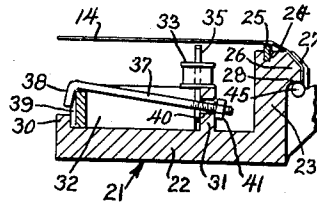
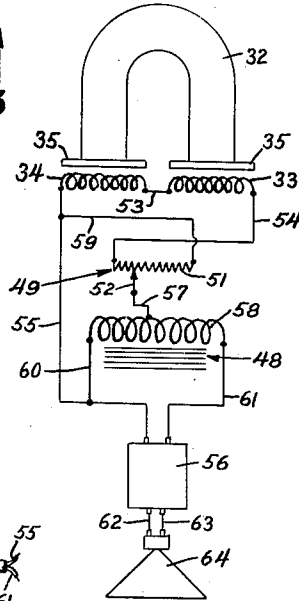


Fig. 5



INVENTOR.  
ARTHUR J. STIMSON.

BY

ATTORNEY.

# UNITED STATES PATENT OFFICE

2,078,350

## ELECTROPHONIC STRINGED INSTRUMENT

Arthur J. Stimson, Los Angeles, Calif., assignor,  
by mesne assignments, to Rudolph Dopyera,  
Los Angeles, Calif.

Application January 19, 1934, Serial No. 707,300

6 Claims. (Cl. 84-1)

This invention relates to improvements in stringed musical instruments.

The general object of the invention is to provide a stringed musical instrument including improved means for directing the vibrations of the strings to an electrical amplifier.

Another object of the invention is to provide a novel electrical pick-up for stringed musical instruments.

An additional object of my invention is to provide a novel mounting for the electrical pick-up of a musical instrument.

A further object of the invention is to provide a novel tail-piece for anchoring the tail ends of the strings of a musical instrument.

Other objects and the advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a top plan view of a guitar embodying the features of my invention;

Fig. 2 is an enlarged fragmentary view similar to Fig. 1 with the cover partly broken away;

Fig. 3 is a section taken on line 3-3 of Fig. 2;

Fig. 4 is a section taken on line 4-4 of Fig. 2; and

Fig. 5 is a wiring diagram showing the manner in which I electrically connect the guitar and an electrical amplifier.

Referring to the drawing by reference characters, I have shown my invention as embodied in a guitar indicated generally at 10. The guitar 10 includes a body 12 of the usual shape having thereon the usual neck 13 on which the usual guitar strings 14 are provided. The body 12 includes a top 15, a bottom 16 and sides 17. The top 15 has a circular aperture 18 therein and positioned in the aperture I provide a cylindrical wall member 19. The top of the wall 19 is spaced slightly below the upper surface of the top 15 and it extends downward to the bottom 16 where it is held between a disk 18' and an annular ring 19'.

This provides a chamber 20 in which I arrange an anchor member which I have indicated generally at 21. The anchor member 21 is preferably made of aluminum and includes a body portion 22 having adjacent one end a transverse upstanding flange 23 thereon (see Fig. 4). Opening through the upper surface of the flange 23, I provide a slot 24 in which a metal bridge member 25 is positioned.

On the face of the flange 23 opposite the body portion 22 the flange includes boss 26 in which a plurality of vertical slits 27 are provided. The

lower ends of the slits open into an arcuate recess 28 in the under face of the boss. Integral with the body 22 and the flange 23 I provide a pair of angularly extending arms 29. Adjacent the end of the anchor body 22 opposite the flange 23 I provide a small upstanding flange 30 and intermediate the flanges 23 and 30 I provide an angularly disposed upstanding flange 31 of less height than the flange 23.

Positioned on the body 22 between the flanges 30 and 31 I provide a horse-shoe magnet 32. Positioned on the flange 31 and on the magnet 32 adjacent the pole ends thereof I provide electromagnets 33 and 34 of the spool type each of which includes a flat, rather elongated, core member 35 which extends above and below the windings. The lower portions of the core members 35 each engage one of the pole ends of the magnet 32. The upper faces of the core members 35 are preferably inclined towards each other as indicated at 36.

The magnet 32 is shown as secured in position by a rod 37 (see Fig. 4) having a bent end portion 38 which is positioned in a recess 39 provided in the outer face of the curved portion of the magnet 32. The end of the rod 37 opposite the portion 38 is threaded and extends through an aperture 40 in the flange 31 and has a nut 41 thereon. When the nut 41 is tightened the rod 37 draws the magnet 32 towards the flange 31 and tightly clamps the core members 35 of the magnets 33 and 34 between the pole ends of the magnet 32 and the flange 31.

The ends of the arms 29 of the anchor member are positioned on the upper face of the wall 19 and are secured thereto by screws 42. The end of the body 22 opposite the arms 29 is supported on a member 43 which is suitably secured to the disk 18'. The body 22 is secured to the member 43 by a screw 44.

The ends of the strings 14 include the usual enlarged members 45 which are positioned in the recess 28 of the boss 26 and the strings are positioned in the slots 27 thereof and pass over the bridge member 25. When the strings 14 are drawn tight they engage the upper surface of the bridge member 25 and are spaced above the upper surfaces of the core members 35 of the electromagnets 33 and 34. By sloping the upper faces of the core members as previously described and indicated at 36 the distance from the core members to the strings may be varied to suit the requirements. Also positioning the core members at an angle to the strings enables further tone variations to be secured.

Positioned over the chamber 20, I provide a cover member 45' which includes a string aperture 46 and an aperture 47 through which the core members 35 project.

5 Mounted on the side of the body 22 of the anchor member 21 I provide a step-up auto-transformer 48 of any standard type and supported on the cover 45' I provide a resistance unit 49 which includes an operating knob 50 positioned above the cover. The resistance unit 49  
10 may be of any standard type including a resistance coil 51 and a slider 52 diagrammatically shown in Fig. 5.

As further shown in Fig. 5 one end of the coil  
15 of the electromagnet 33 is connected by a wire 53 to one end of the coil of the other electromagnet 34. The opposite end of the coil 33 is connected by a wire 54 to one end of the resistance coil 51 and the opposite end of the electro-  
20 magnet coil 34 is connected by a wire 55 to an amplifying unit 56. The slider 52 of the resistance unit 49 is connected by a wire 57 to the coil 58 of the transformer intermediate the length thereof. The opposite end of the resistance coil  
25 51 is connected by a wire 59 to the wire 55.

One end of the transformer coil is connected by a wire 60 to the wire 55 and the opposite end of the transformer coil is connected by a wire 61  
30 to the amplifying unit 56. The amplifying unit 56 is shown as connected by wires 62 and 63 to an electrically actuated resonator 64.

In the use of my invention the movement of the strings 14 which constitute para-magnetic  
35 bodies over the cores of the magnet produces a change in the magnetic permeability of the core and thereby induces various voltages which are in synchronization with the vibrating member 14.

From the foregoing it will be apparent that I  
40 have provided novel means for directing the vibrations of the strings of a stringed musical instrument through an electrically actuated resonator which is simple in construction and highly efficient in use.

45 Having thus described my invention, I claim:

1. In a pick-up for a stringed musical instrument which includes an anchor member, a string supporting bridge and means to secure one end of the strings to said anchor member, a horse-  
50 shoe magnet adapted to be secured to said anchor member and a pair of electro-magnets each including a coil and an elongated core member extending above and below the associated coil, said core members each engaging a pole of said  
55 horse-shoe magnet.

2. In a pick-up unit adapted to be used with a stringed musical instrument including a body having playing strings thereon, an anchor member adapted to be mounted on the body, a horse-  
60 shoe magnet on said anchor member, a pair of electro-magnets including elongated core members extending beyond their associated windings, said core members each engaging a pole of said horse-  
65 shoe magnet, said core members being adapted to be positioned diagonally relative to the strings with the strings passing over said core members and spaced closely adjacent and thereabove, the upper faces of said core members being inclined downward towards each other.

3. In a pick-up unit for a stringed instrument, an anchor member, a horse-shoe magnet mounted on the anchor member and adapted to be positioned below the strings of a musical instrument, a pair of electro-magnets including core members  
5 extending above and below their associated windings, said core members each engaging one pole of said horse-shoe magnet, said core members being adapted to be positioned transversely of the strings and to be spaced closely adjacent and  
10 below the strings with faces of said core members adjacent the strings inclined away from said strings towards the adjacent faces of said core members, said electro-magnet windings being  
15 adapted to be connected to a resonator unit.

4. In a pick-up unit, an anchor member adapted to be mounted on the body of a stringed musical instrument, said anchor member including a stringed supporting bridge and means to engage one end of the strings of the musical instrument, a horse-shoe magnet on said anchor  
20 member, and a pair of electro-magnets each including a spool member and an elongated core member extending above and below the spool member, said core members each engaging one  
25 pole of said horse-shoe magnet, said core members being adapted to be positioned diagonally relative to the strings with the strings passing over said core members and being spaced closely adjacent and thereabove, the upper faces of said  
30 cores being inclined downward towards each other.

5. In a pick-up unit, an anchor member adapted to be mounted on the body of a stringed musical instrument, said anchor member including a stringed supporting bridge and means to engage one end of the strings of the musical instrument, a horse-shoe magnet on said anchor  
35 member, a pair of electro-magnets each including a spool member and an elongated core member extending above and below the spool, said core members each engaging one pole of said horse-shoe magnet, the upper faces of said core members being inclined, said core member being  
40 adapted to be spaced closely adjacent and below the instrument strings and the windings of said electro-magnets being adapted to be connected to an electrically actuated resonator.

6. In a pick-up unit, an anchor member adapted to be mounted on the body of a stringed musical instrument, said anchor member including a stringed supporting bridge and means to engage one end of the strings of the musical instrument, a horse-shoe magnet on said anchor  
50 member, a pair of electro-magnets each including a spool member and an elongated core member extending beyond its associated spool, said core members each engaging one pole of said horse-shoe magnet, said core members being  
55 adapted to be positioned diagonally across the strings with the upper faces of said cores inclined downward towards each other, and with the core members spaced closely adjacent and below the strings, said electro-magnets being adapted to be  
60 connected to an electrically actuated resonator.

ARTHUR J. STIMSON.