

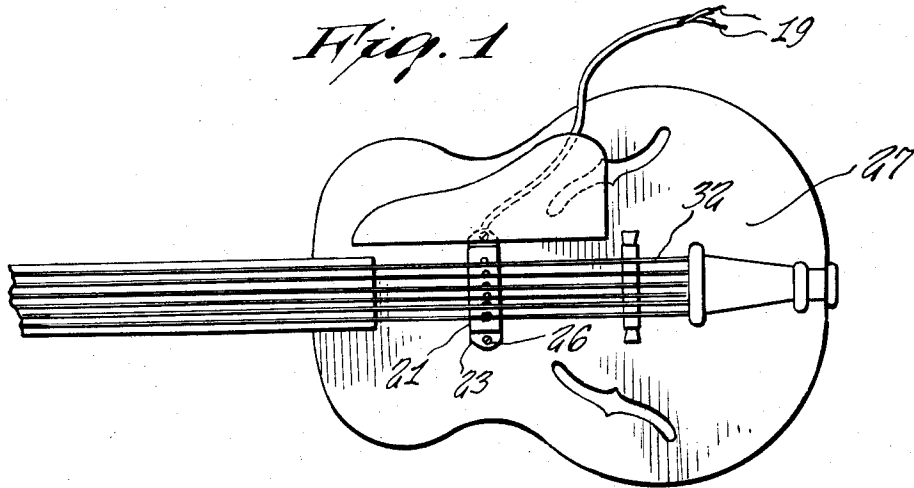
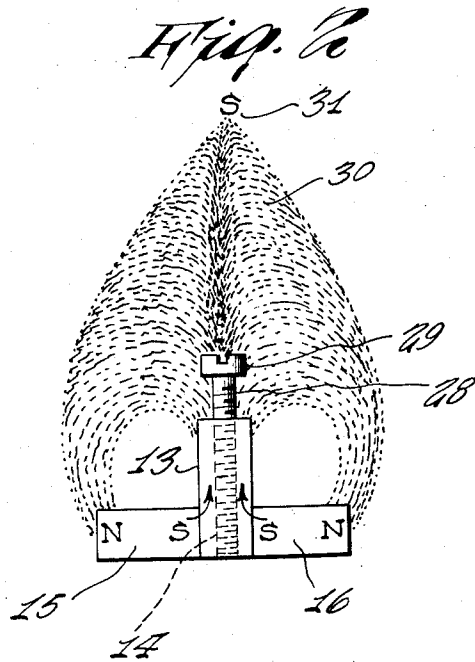
Nov. 10, 1959

C. F. SCHULTZ
MAGNETIC PICK-UP DEVICE

2,911,871

Filed Sept. 14, 1954

2 Sheets-Sheet 1



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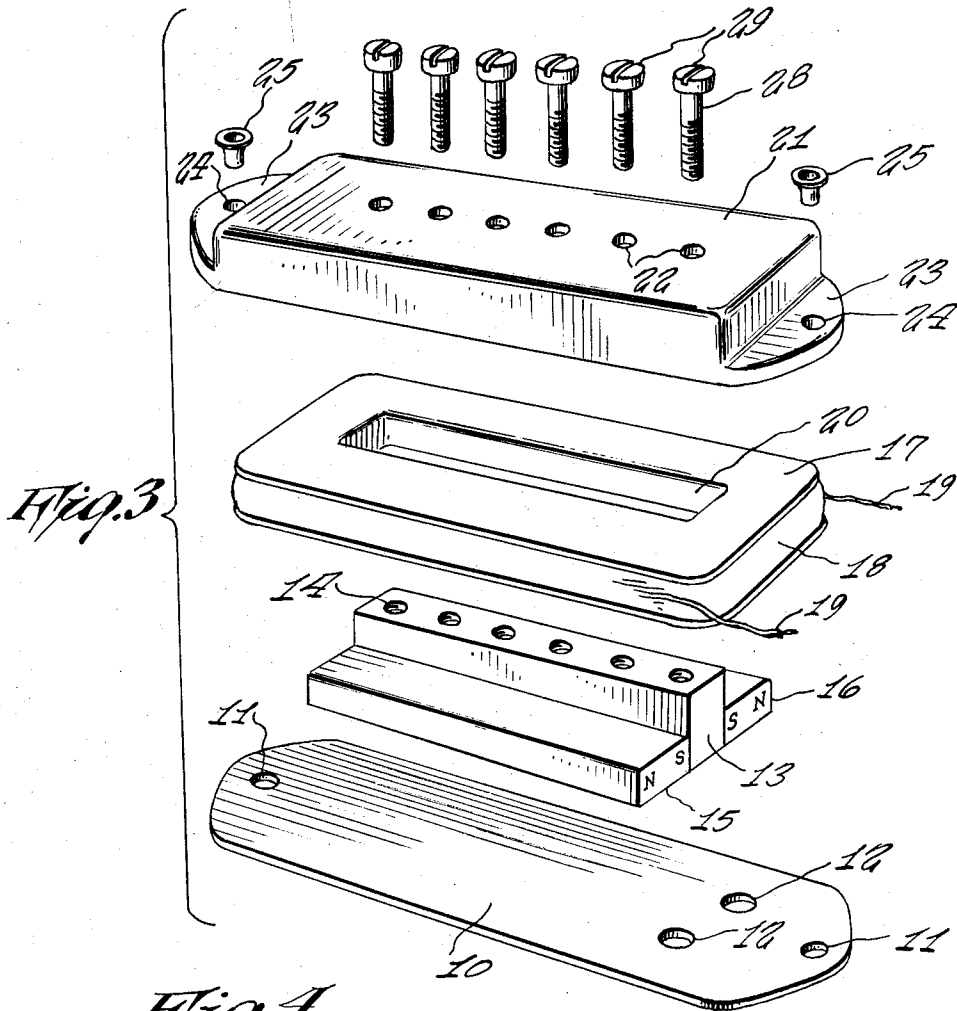
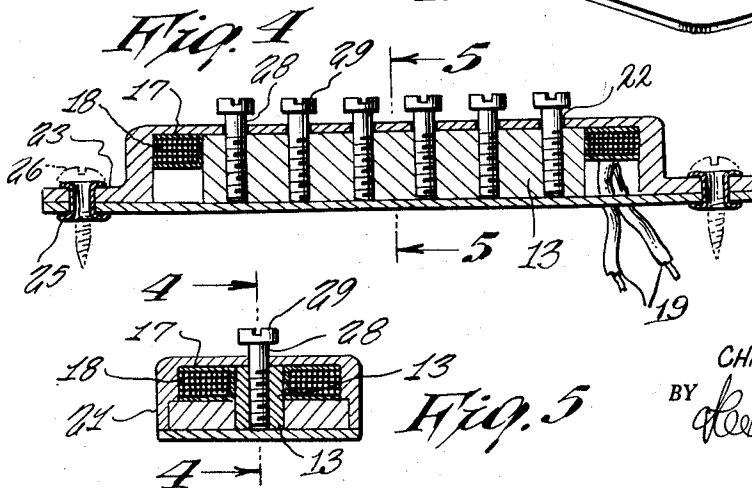
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MAGNETIC PICK-UP DEVICE

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Application September 14, 1954, Serial No. 455,857

1 Claim. (Cl. 84—1.15)

This invention relates to electro-magnetic pick-up devices.

It is an object of the present invention to provide an electro-magnetic pick-up device for individually varying the amplitude of the reproduction of the various strings of a stringed musical instrument or the like wherein permanent magnets are arranged so as to provide a controlled and increased density of space extension of lines of force which are adapted to be cut by the string vibrations and to induce modulated currents in a coil element connected to a tone control and amplifier for the instrument.

It is another object of the present invention to provide an electro-magnetic pick-up device for individually varying the amplitude of the reproduction of sound caused by metallic vibratory objects including steel or electrically conducting strings of a stringed musical instrument or the like and which will capture the maximum vibration of the string and gather the maximum signal therefrom by controllably extending the magnetic field area.

Other objects of the present invention are to provide an electro-magnetic pick-up device bearing the above objects in mind and which is of simple construction, has a minimum number of parts, is easy to assemble and use and is efficient in operation.

For other objects and a better understanding of the invention reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a fragmentary plan view of a musical instrument showing the invention in operative use thereon;

Figure 2 is an end elevational view showing the arrangement of the permanent magnets and their relation to the center pole piece and illustrating the essence of the invention;

Figure 3 is an exploded perspective view of the parts comprising the invention;

Figure 4 is a vertical sectional view taken along the line 4—4 of Figure 5 and

Figure 5 is a vertical sectional view taken along the line 5—5 of Figure 4.

Referring now more in detail to the drawing wherein similar reference numerals identify corresponding parts throughout the several views, 10 represents a fiber base plate having mounting openings 11 at the opposite ends thereof, the base plate 10 at one end adjacent to one of the mounting openings 11 being provided with a pair of openings 12 for a purpose which will hereinafter become clear.

A central rectangular pole piece 13 is provided with a plurality of longitudinally spaced, vertical and internally threaded openings 14 therethrough, the pole piece 13 being disposed along the central longitudinal portion of the base plate 10.

A pair of permanent magnets 15 and 16 similar in length and shape to the pole piece 13 are disposed across the top of the base plate 10 at each side of the pole piece 13 (Figure 3), the south poles of each of the magnets

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15 and 16 lying along the inner longitudinal edges thereof on opposite sides of pole piece.

A coil form 17 having a peripheral groove 18 around which wire 19 is wound fits downwardly onto the magnets 15 and 16, the coil form 17 being provided with a central longitudinal opening 20 which receives the pole piece 13 upwardly therethrough.

A brass or plastic casing 21 open at the bottom is adapted to fit downwardly over the top wall of coil form 17, the casing 21 being provided with the longitudinally spaced openings 22 aligned with the upper ends of the generally threaded openings 14 of the pole piece 13. Casing 21 at the opposite ends thereof along the lower edges is integrally formed with extensions 23 adapted to overlie the ends of the base plate 10, the extensions 23 being provided with openings 24 aligned with the mounting openings 11. Eyelets 25 are positioned within the aligned openings 24 and 11 and receive downwardly therethrough wooden screws 26 (Figure 4) by means of which the base plate 10 and the casing 21 are secured to the instrument 27 (Figure 1).

A plurality of adjusting screws 28 having enlarged slotted heads 29 are screwed into the internally threaded openings 14 through the casing openings 22 (Figure 4). The screws may be "tuned" by means of a slotted head 29 in a manner well known to those well skilled in the art.

A magnetic field 30 (Figure 2) is created by the opposite positioning of permanent magnets 15 and 16 adjacent the sides of pole piece 13. The permanent magnetic fields opposing each other south to south at the iron pole piece 13 do not repel each other but are thrust upwardly into the pole piece 13, screws 28 and beyond thereby creating a tall magnetic south phase of the field before the lines of force proceed to the north ends of the magnets. This tall magnetic south phase can be extended more by adding additional permanent magnets having south pole abutments with the pole piece 13.

The pole piece 13 is formed of soft iron as are the adjustment screws 28. The magnetic lines of force find an easy path therethrough and extend to a greater distance whereby to capture a maximum of the vibrations of the strings 32. Coil 19 disposed around the coil form 17 surrounds the pole piece 13 and gathers modulated currents through induction from the string vibrations, the latter breaking the magnetic lines of force which pass through and around said coil before returning to the magnets. The coil terminals 19 are connected to the tone control and amplifier of the instrument 27 in the usual manner.

There has thus been provided permanent magnet suitably disposed adjacent a pole piece to increase the flux and area thereof whereby to encompass the area of the string vibrations controllably. With the increase in flux and area the pick-up coil 19 receives modulated and induced currents thereby gathering true and converted signals from the strings. Adjustability of screws 28 permits the variation or control in the amplitude reproduced from any one string.

While various changes may be made in detail construction, it should be apparent that minor changes and variations in construction, positioning connection and material of the parts of the invention may all be resorted to without departing from the spirit of the invention and the scope of the appended claim.

I claim:

In an electro-magnetic pick-up device adapted to be disposed adjacent sound producing vibratory elements of metal comprising an elongated and projecting magnetically permeable pole piece, elongated permanent magnets disposed in contact with and on the opposite longitudinal faces of said pole piece, the south poles of said magnets being disposed adjacent to each other on oppo-

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site faces of said pole piece to increase the area and density of the magnetic field, and a pick-up coil surrounding said pole piece to receive modulated induced currents as lines of force of the magnetic field are broken by vibration of the said sound producing vibratory elements, said pick-up coil comprising a relatively flat coil form having a central elongated opening receiving said pole piece projecting therethrough and adapted to rest on said permanent magnets, said coil form around the peripheral side edge having a continuous groove, and a coil conductive material wound around said coil form within said groove, an amplifier, the ends of said conductive material being connected to said amplifier, a base plate supporting said magnets and the pole piece in coplanar relationship, said base plate having extensions beyond the opposite ends of said magnets and pole piece, and a casing open at the bottom and adapted to fit over said coil form, magnets and base plate, the casing main wall having

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aligned and spaced openings to receive pole piece adjustment screws therethrough with the heads thereof disposed beyond said casing main wall, extensions at opposite ends of said casing adjacent the lower edge thereof and adapted to overlie said first-mentioned extensions, and securing means penetrating the first and second mentioned extensions for affixation of the device.

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