Dec. 5, 1961 C. A. MONFELT 3,011,381

ACCORDION PICKUP

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FIG. 1.

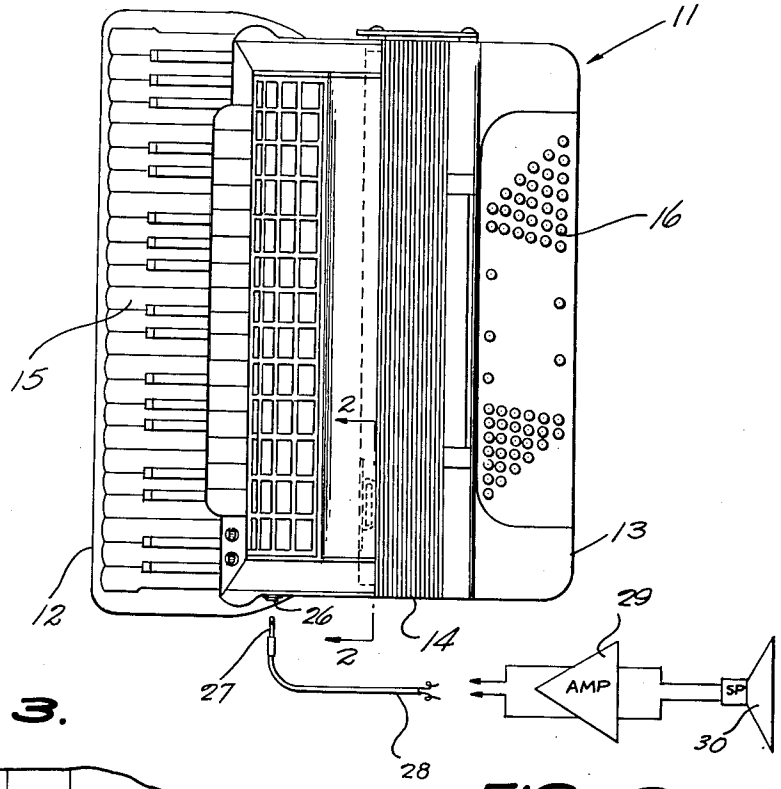


FIG. 3.

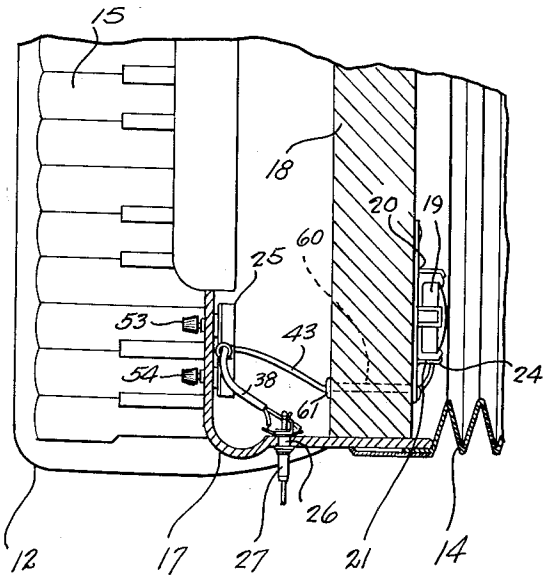
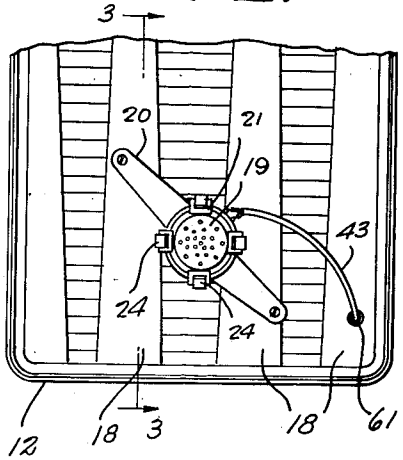


FIG. 2.



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FIG. 4.

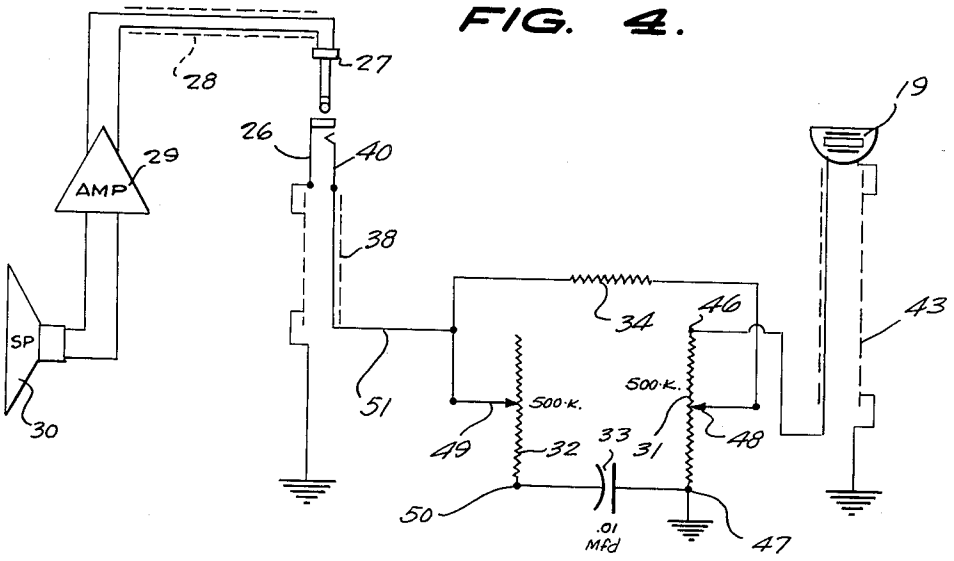
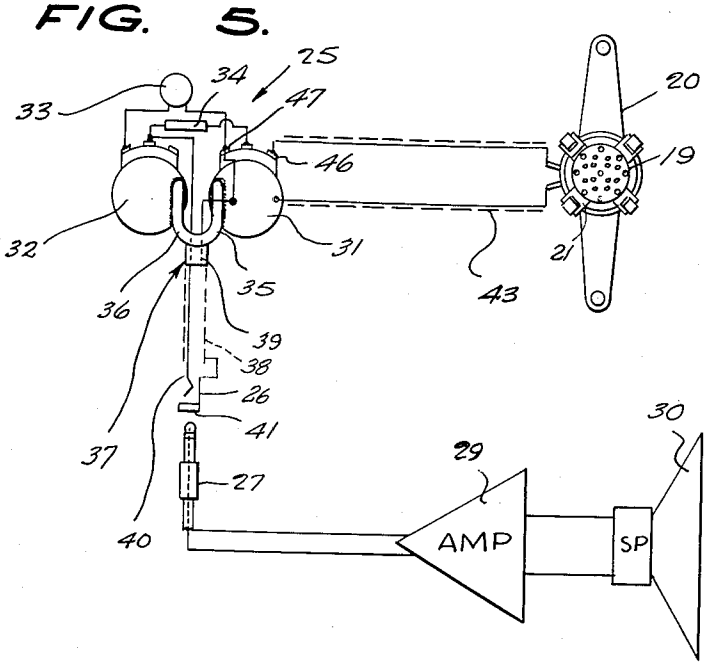


FIG. 5.



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ACCORDION PICKUP

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2 Claims. (Cl. 84—376)

This invention relates to electrical pickup apparatus for musical instruments, and more particularly to an improved microphone pickup arrangement for accordions.

A main object of the invention is to provide a novel and improved microphone pickup arrangement for accordions, the arrangement involving only a few parts, providing accurate sensitivity both to the high and low tones of the accordion, and being relatively easy to install in a conventional accordion without any substantial modification of the structure of the accordion.

A further object of the invention is to provide an improved accordion pickup arrangement which requires relatively inexpensive components, which is very compact in size so that it can be easily installed inside a conventional accordion without requiring any additional housings or other new structure, and being sufficiently compact in size so that it does not interfere with the operation of the accordion.

A still further object of the invention is to provide an improved accordion pickup arrangement which provides proper balance of tone and volume, which minimizes distortion, and which accurately responds to the entire tonal range of the instrument in which it is installed, being particularly efficient in responding to and transmitting the tones in the upper portion of the tonal register of the instrument.

A still further object of the invention is to provide an improved pickup assembly for use in an accordion, the assembly involving only a few parts, being easy to install and requiring only a small amount of time for the installation thereof, and being so located that the control elements thereof are readily accessible and may be easily operated without interfering with the normal playing of the accordion.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIGURE 1 is a top view of an accordion provided with an improved pickup assembly in accordance with the present invention.

FIGURE 2 is an enlarged fragmentary vertical cross sectional view taken substantially on the line 2—2 of FIGURE 1 and showing the manner in which the pickup microphone is mounted adjacent the ends of two of the treble reed blocks of the accordion.

FIGURE 3 is a cross sectional view taken substantially on the line 3—3 of FIGURE 2.

FIGURE 4 is a schematic wiring diagram showing the electrical connections of the pickup microphone, control device, and output jack of the pickup assembly employed in FIGURES 1 to 3, and illustrating the manner in which the assembly is connected to a reproducing system.

FIGURE 5 is a pictorial wiring diagram of the circuit shown in FIGURE 4.

Referring to the drawings, **11** designates an accordion of substantially conventional construction and having a treble side **12** and a base side **13** with a bellows **14** connecting said sides. The treble side **12** includes a piano keyboard **15** and the base side **13** is provided with the usual push button keyboard **16**. The treble side of the accordion is provided with the rigid wall **17** located adjacent the keyboard **15**. Also provided in the treble side of the accordion are the accordion reed blocks **18** which support the reeds and which are affected by air passing thereby, in the usual manner of operation of an accordion.

In accordance with the present invention a bracket member **20** is secured to an adjacent pair of treble reed blocks **18**, **18**, and a crystal microphone **19** is suitably mounted in the bracket member and is thus supported in the space between the pair of reed blocks **18**, **18**. As shown in FIGURES 2 and 3, the crystal microphone **19** faces the base side of the accordion and is enclosed in the bellows **14**. Suitable cushioning means **21**, such as sponge rubber, or the like, is provided between the crystal microphone **19** and the spaced supporting arms **24** of the bracket member so as to cushion the microphone with respect to the relatively rigid bracket member **20**.

As previously mentioned, the bracket member **20** is provided with the supporting arms **24** which are spaced at 90 degrees with respect to each other to define a receiving socket for the microphone **19**, the arms **24** being inturned at their ends to define retaining lugs, and the cushioning strips **21** being disposed between said retaining lugs and the microphone **19** in the manner shown in FIGURES 2 and 3. The microphone **19** is thus resiliently supported in the space between the pair of adjacent reed blocks **18**, **18** and is thus supported in a position to accurately respond to sound vibrations generated in this space, and particularly, the vibrations developed in the base side of the accordion, since the microphone faces said base side. However, since the microphone is substantially omni-directional, it also responds accurately to the treble tones generated by the reeds of the treble reed blocks, located relatively closely adjacent thereto.

Designated generally at **25** is a control unit which is mounted on the rigid wall **17** adjacent one end of the piano keyboard **15**, and also mounted in the rigid wall **17** is an output jack **26** of the miniature type adapted to receive a conventional miniature plug **27**. Thus, the plug **27** is connected by a suitable shielded cable **28** to the input of a conventional amplifier **29**, and the output of the amplifier is connected to a loud speaker **30**.

Control unit **25** comprises a volume control potentiometer **31**, a tone control potentiometer **32**, a bypass condenser **33**, and a coupling resistor **34**. The casings of the potentiometers **31** and **32** are rigidly connected to the spaced arms **35** and **36** of a sleeved mounting lug **37** which is secured to and rigidly connects the potentiometers **32** and **31** in side-by-side relationship, as shown in FIGURE 5. The shielded output cable **38** extends through the sleeve portion **39** of the mounting lug **37**, the center conductor of the cable **38** being connected to the central resilient contact arm **40** of the jack **26**, and the shield of the cable being connected to the ring element **41** of the jack. Thus, the shield of the cable may be considered as ground in the circuit arrangement illustrated. A shielded cable **43** connects the microphone to the input of the control unit **25**, the shield of the cable **43** being grounded, as shown in FIGURE 4, and the central conductor of said cable being connected to one terminal **46** of the volume control potentiometer **31**, the opposite terminal of the potentiometer winding being grounded, as shown at **47**. The adjustable contact element **48** of potentiometer **31** is connected through the coupling resistor **34** to the adjustable contact element **49** of the tone control potentiometer **32**. One terminal **50** of the tone control potentiometer **32** is connected to ground through the bypass condenser **33**. As shown in FIGURES 4 and 5, the resilient center contact arm **40** of the output jack **26** is connected to the adjustable contact element **49** of the tone control potentiometer **32** by a wire **51**.

As will be readily apparent from FIGURES 4 and 5, the sound vibrations are picked up by the crystal microphone **19** and are converted into electrical signals which are thus delivered to the winding of the potentiometer **31** which thus acts as a termination for the microphone cir-

cuit. A selected signal amplitude is supplied from the winding of the potentiometer **31** through the adjustable contact **48** and the coupling resistance **34** to the terminal wire **51**, and thus to the resilient center contact arm **40** of output jack **26**. A certain amount of high frequency signal energy is bypassed to ground through the tone control branch comprising a selected portion of the winding of the tone control potentiometer **32** and bypass condenser **33**. The remaining signal energy is delivered to the input of amplifier **29** and reproduced by the loud speaker **30**. The potentiometers **31** and **32** are provided with the control knobs **53** and **54** which are located adjacent one end of the piano keyboard **15**, as is clearly shown in FIGURES 1 and 3, allowing said knobs to be easily operated by the player of the accordion so that he may establish a desired balance between volume and tone at any time during the operation of the instrument.

In a typical embodiment of the invention, the coupling resistance had a value of 22,000 ohms, the potentiometers **31** and **32** each had a value of 500,000 ohms, and the bypass condenser **33** had a value of .01 microfarad.

As shown in FIGURE 3, the microphone cable extends through a bore **60** formed in one of the reed blocks **18**, and thence to the control unit **25**. The bore **60** is filled with wax, as shown at **61**, around the microphone cable **43** to thus rigidly secure the cable in the reed block **18** and to prevent any undesired vibrations of the cable during the operation of the instrument.

The crystal microphone **19** is of conventional construction and is preferably of the miniature type. In a typical installation, the crystal microphone had a diameter of approximately one and one-quarter inches and a thickness of approximately ⅜ of an inch. The frequency response of the microphone was substantially flat between a lower limit of thirty cycles per second to approximately 10,000 cycles per second as an upper limit with an output of reasonable amplitude. Thus, the microphone was entirely adequate in picking up and transducing musical sounds over the entire tonal register of the instrument and developed substantial signal energy so that the loss introduced by the tone control circuit did not seriously interfere with the tone quality delivered by the loud speaker **30**.

As will be well understood, by employing miniaturized elements, such as a miniature output jack **26**, and miniaturized potentiometers **31** and **32**, as well as other miniaturized components, now commercially available, the assembly is easily installed in a standard accordion without requiring any substantial modification of the accordion and without interfering with the normal playing thereof.

While a specific embodiment of an improved microphone pickup arrangement for an accordion has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In combination with an accordion having a treble side provided with a piano keyboard and having a rigid wall adjacent said piano keyboard and a base side with a bellows connecting said sides and spaced treble reed blocks facing said base side and said bellows, bracket means secured to a pair of adjacent treble reed blocks, a microphone mounted in said bracket means and extending across said adjacent pair of reed blocks and facing said base side and being enclosed in said bellows, a control unit mounted on said rigid wall adjacent one end of said piano keyboard, an output jack mounted in said rigid wall adjacent said control unit, said control unit including a volume control potentiometer and a tone control potentiometer, and conductor means contained within the accordion and connecting said microphone to said output jack through said control unit.

2. In combination with an accordion having a treble side provided with a piano keyboard and having a rigid wall adjacent said piano keyboard and a base side with a bellows connecting said sides and spaced treble reed blocks facing said base side and said bellows, bracket means secured to a pair of adjacent treble reed blocks, a microphone mounted in said bracket means and extending across said pair of adjacent treble reed blocks and facing said base side and being enclosed in said bellows, a control unit mounted on said rigid wall adjacent one end of said piano keyboard, an output jack mounted in said rigid wall adjacent said control unit, said control unit including a volume control potentiometer connected across the microphone, a tone control potentiometer, a condenser, and means connecting said tone control potentiometer and condenser in series across the output terminals of the volume control potentiometer, and conductor means contained within the accordion and connecting the output of said control unit to said output jack.

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