Feb. 1, 1949. B. EISENBERG ET AL 2,460,494

FOOT PEDAL CONTROL RHEOSTAT

Filed July 13, 1946

FIG. 1

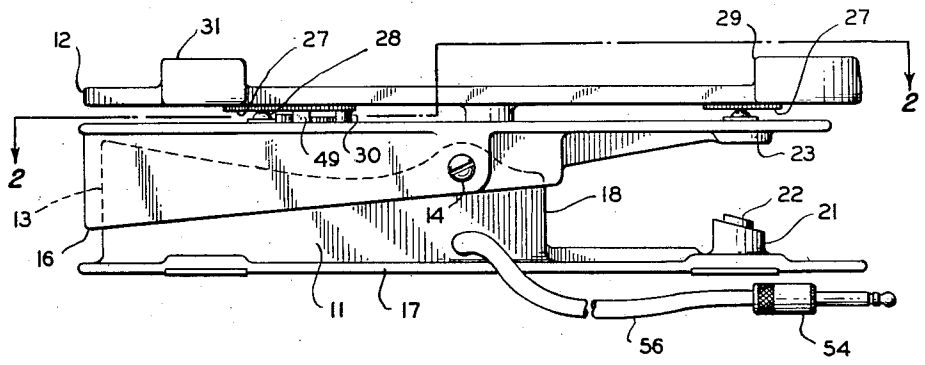


FIG. 2

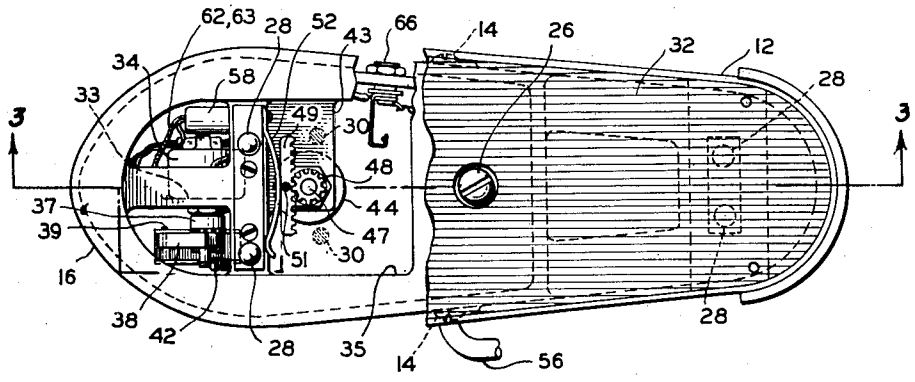
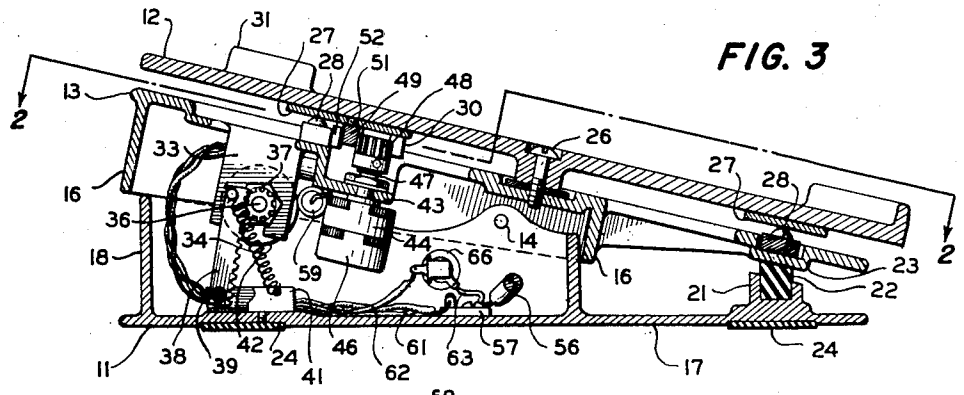


FIG. 3



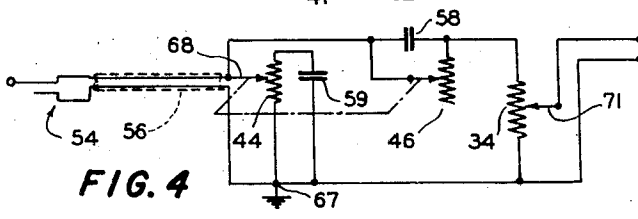


FIG. 4

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FOOT PEDAL CONTROL RHEOSTAT

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4 Claims. (Cl. 201—48)

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The present invention relates to improvements in pedal control devices, and more particularly to improvements in pedal control devices for controlling electrical musical instruments or the like.

At the present time, there exist several types of musical instruments which produce musical sound by means of electrical amplifier and loudspeaker arrangements. One example of such an instrument is known as the electrical guitar. In instruments of this type, the musician must use both hands in playing the instrument properly. However, a necessary adjunct of such instruments is a convenient control for the amplifier and loudspeaker, to increase the number and range of the various musical effects produced. A useful control device should be able to vary continuously both the tonal quality and the volume of the musical output, with a minimum hindrance to the normal playing upon the instrument itself.

These advantages are gained by the present invention, in which a single foot-operated control of novel and improved construction is adapted to adjust both the volume and tonal quality of the output from a musical system of the above-described type.

According to the present invention, a single foot-operated member is adapted to be rotatably adjusted about two independent axes, one generally horizontal and the other generally vertical. Variable rheostats or potentiometers are mounted in novel fashion so as to be independently controllable and actuatable by adjustment of the foot-operated or pedal member, such rheostats or potentiometers being included in suitable manner in the input to the amplifier-loudspeaker circuit so as to control volume and tone of the output.

Accordingly, it is an object of the present invention to provide an improved pedal control device adapted for simultaneous, independent and continuous control of two separate electrical factors in an electrical musical instrument system or the like.

A further object of the present invention is to provide an improved pedal control device for independently actuating a pair of variable resistance devices.

Other objects and advantages will become apparent from the following description and from the attached drawing, in which

Fig. 1 is a side elevation view of a preferred embodiment of the invention;

Fig. 2 is a top view, partly broken away, of the device of Fig. 1, viewed along line 2—2 thereof;

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Fig. 3 is a side elevation view partly in cross-section of the device of Figs. 1 and 2, taken along line 3—3 of Fig. 2; and

Fig. 4 is a schematic circuit diagram of the device of the preceding figures.

The novel foot pedal control illustrated in the drawing has three separate sections. These are a base 11, a pedal 12 and a rocker section 13. Base 11 comprises a flat portion 17 and a thin vertically extending shell 18 preferably integrally formed therewith, and extending around part of the periphery of the flat portion 17. As will be seen, the shell 18 serves to conceal and protect the mechanism and circuit elements of the device, and to serve as a support for the rocker section 13 and the pedal 12.

Rocker section 13 also comprises a flat portion 19 and a shell 16 extending generally perpendicularly downward therefrom and around a part of the periphery thereof. Rocker shell 16 also extends around base shell 18, while spaced therefrom, to enable relative motion therebetween, as described below. Rocker shell 16 also encloses part of the mechanism, and together with base shell 18 forms a pleasing exterior and protective casing for the device.

The rocker section 13 is pivotally mounted on the base 11 by a pair of pivots, each of which, by way of example, may comprise a screw 14 passing freely through the rocker shell 16 and threaded into the base shell 18. A bushing may be used around each screw 14 to provide a smooth pivot bearing.

The flat portion 17 of base 11 is formed with a boss 21 which carries a soft resilient bumper 22, such as of soft rubber, which cooperates with a boss 23 formed on the rocker flat portion 19 to serve as a stop for clockwise motion of the rocker section about the pivot screws 14. A similar stop may be used for counterclockwise movement. The base flat portion 17 also carries suitable soft base cushions 24 which prevent slippage of the device when placed on the floor and operated.

The pedal 12 is pivotally mounted upon the rocker section 13 for lateral movement with respect thereto, by means of a pivot screw 26 extending freely and perpendicularly through the pedal 12 and screwed into the rocker flat portion 19. Pedal 12 carries a pair of hardened steel bearing plates 27 cooperating with hardened steel bearing balls 28 suitably mounted upon the rocker flat portion 19 to facilitate easy and continuous adjustment of pedal 12 about the pivot screw 26. Pedal 12 also has formed thereon a heel-receiv-

ing lip 29 and a pair of side lips 31 to make it easier for the musician's foot to rotatably adjust the pedal 12 about the pivots 26 and 14. Also, the upper surface of pedal 12 is preferably made ribbed as at 32 to increase friction between the foot and the pedal, and to improve its appearance. A pair of pins 30 are fixed to pedal 12 and extend within rocker shell 16 through an opening 35 in the rocker flat portion 19. Pins 30 provide stops for the lateral motion of pedal 12, by coaction with the side walls of rocker shell 16.

Formed on rocker section 13 within shell 16 is a downwardly depending flange 33 which carries a potentiometer 34 having a rotatable actuating shaft 36 to which is fixed a pinion 37. Engaging pinion 37 is a linear rack 38 pivoted at 39 to an upstanding member 41 fixed to base 11. A tension spring 42 extends between member 41 and rack 38, and maintains the rack 38 in engagement with pinion 37. Accordingly, as rocker section 13 is pivoted about pivot screws 14, pinion 37 rides up and down on rack 38 and turns rheostat shaft 36 to vary the setting of potentiometer 34. The use of pivoted linear rack 38 avoids the necessity of using a circular rack, and moreover serves equally as well and is much simpler to manufacture and assemble.

Also formed on rocker section 13 is a substantially flat support 43 parallel to flat portion 19 which carries a pair of ganged potentiometers 44, 46 having a single actuating shaft 47 to which is fixed a pinion 48. Engaging pinion 48 is a second linear rack 49 which is pivotally mounted on pedal 12 at its center 51. A bowed single-leaf spring 52 fixed at one end to rocker section 13 with the center of its bow opposite pinion 48 keeps rack 49 in engagement with pinion 48. Thus, as pedal 12 is rotated about its pivot 26, rack 49 is moved substantially horizontally and rotates pinion 48 to adjust potentiometers 44, 46. The central pivot 51 of rack 49 permits it to turn slightly to keep in engagement with pinion 48 in all positions, and avoids the necessity of a circular rack. The spring 52 remains always opposite pinion 48, and is thus always effective no matter what the position of rack 49 may be.

The device described above accordingly provides a ready adjustment of two independent sets of rheostats or potentiometers 34 and 44, 46 by a single pedal 12 upon up-down rotation about a first horizontal axis and lateral rotation about a second substantially vertical axis perpendicular to the first axis. This provides a desirable control especially useful for electrical musical instruments requiring simplified control for two separate characteristics, such as volume or tone.

Fig. 4 shows an exemplary circuit in which the present control has notable utility. This circuit includes a two-conductor plug 54 adapted to be plugged into the output of the electrical instrument, for example, and connected by a cable 56 to a simple terminal strip 57 mounted on base 11. Rocker section 13 carries several condensers 58, 59 connected to terminal strip 57 and potentiometers 34, 44, 46 by flexible wires 61, 62, 63, in the manner shown by the circuit diagram of Fig. 4.

One terminal of plug 54 is grounded as at 67, while the other is connected to the variable tap 68 of potentiometer 44 across whose outer terminals condenser 59 is connected. One of these outer terminals of potentiometer 44 is also grounded at 67. The tap 68 is connected through the parallel-connected condenser 58 and rheostat 46 to one outer terminal of potentiometer 34, whose other outer terminal is grounded. The

variable tap 71 and ground 67 are connected to an output jack 66, adapted to receive a plug similar to plug 54, but connected to the amplifier and loudspeaker unit, for example, which is mounted on the side wall of base shell 18.

Ganged potentiometers 44, 46 actuated by lateral movement of pedal 12 adjust the tone quality of the musical output. Potentiometer 34, actuated by vertical movement of pedal 12, adjusts the volume of the musical output. Thus the pedal control unit of the present invention is readily coupled into the system in which it is to be used, while still remaining as a separate, compact and simple unit of pleasing appearance.

It will be understood that the details of the device described above are susceptible of variation as to their specific features, and that the scope of the present invention is not to be restricted to the illustrative embodiment herein described and shown, but is as defined in the appended claims.

What is claimed as the invention is:

1. A foot pedal control for musical instruments or the like comprising a base, a rocker pivotally mounted on said base for vertical rotation about a substantially horizontal axis, a pedal pivotally mounted on said rocker for lateral rotation about an axis perpendicular to said horizontal axis, a first variable resistance device carried by said rocker and having a control shaft, a first pinion fixed to said control shaft, a linear rack pivotally connected at one end to said base and engaging said pinion, a first spring urging said rack toward said pinion, a second variable resistance device carried by said rocker and having a control shaft, a second pinion fixed to said latter control shaft, a second linear rack pivotally mounted at its center to said pedal, and a bowed spring fixed to said pedal and urging said rack into engagement with said pinion, said spring having its maximum bow opposite said second pinion, whereby lateral adjustment of said pedal about said perpendicular axis adjusts said second resistance device and vertical adjustment of said pedal about said horizontal axis adjusts said first resistance device.

2. A foot pedal control device comprising a first relatively stationary member, a second foot-operated relatively movable member, a variable circuit element carried by one of said members and having a variable control shaft, a pinion fixed to said shaft, a linear rack pivotally connected at its center to the other of said members, and a bowed flat spring fixed to said one member and urging said rack toward said pinion, said spring having its bow opposite said pinion.

3. A foot pedal control for musical instruments or the like comprising a base, a rocker member pivotally mounted on said base, a pedal pivotally mounted on said rocker member, a first variable circuit element carried by said rocker member and having a first control shaft, a first pinion fixed to said shaft, a first rack pivotally connected at one end to said base and resiliently urged into engagement with said pinion, a second variable circuit element carried by said rocker member and having a second control shaft, a second pinion fixed to said second shaft, a second rack pivotally mounted on said pedal and resiliently urged into engagement with said second pinion, whereby said two circuit elements may be independently actuated by adjustment of said pedal in two directions.

4. A variable control for an adjustable resistance device having a movable element, comprising a support adapted to rotatably hold said ele-

ment, a pinion fixed to said element, a bowed leaf spring on said support, and a linear rack engaging said pinion and pressed by said spring toward said pinion, and an adjustable member, said rack being pivotally fixed at its center to said adjustable member, whereby upon movement of said member, said movable element is adjusted correspondingly.

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