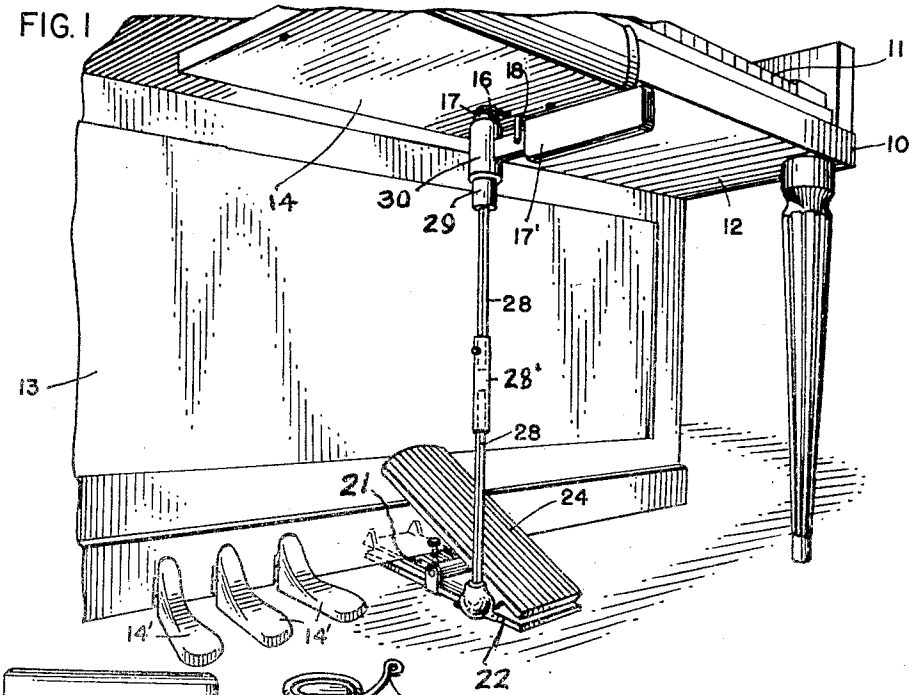
June 14, 1955 J. A. KOEHL 2,710,556

EXPRESSION CONTROL

Filed Feb. 13, 1953

FIG. 1



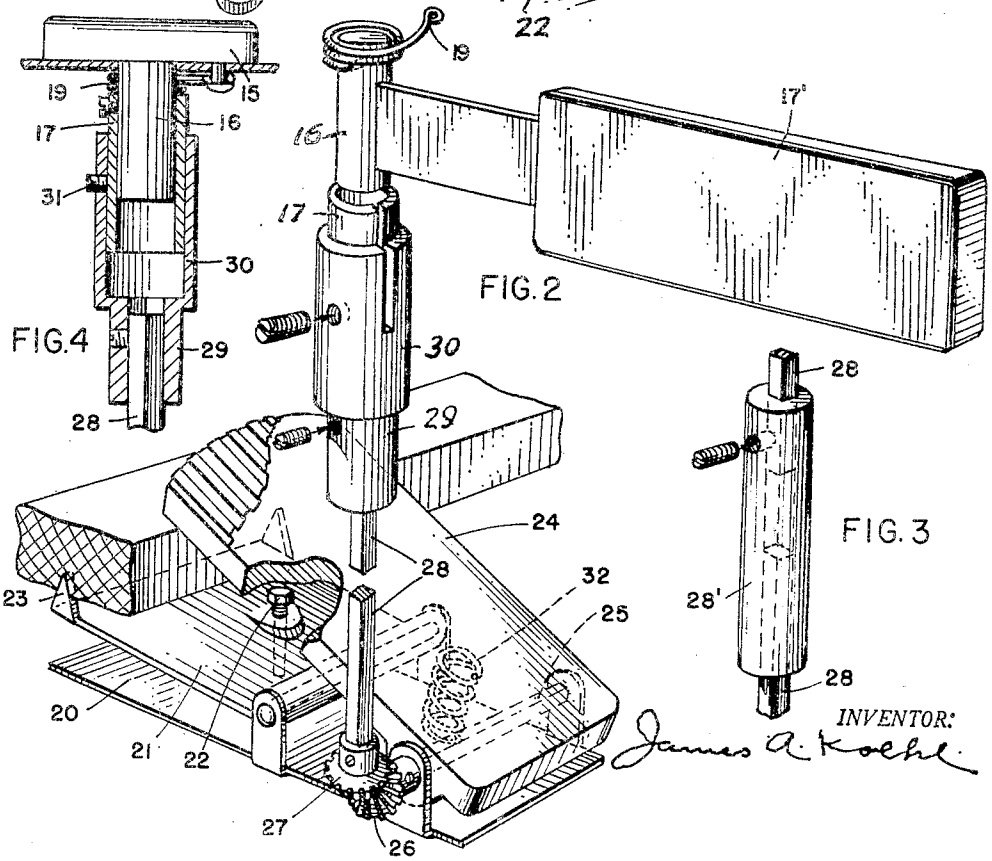


FIG. 3

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EXPRESSION CONTROL

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2 Claims. (Cl. 84—1.09)

This invention relates to expression controls and more particularly to a type of control for use in the tone signal translating circuit of an electrical keyboard musical instrument employing means for producing audio frequency tone signals which may be selectively translated into audible tones for musical expression upon playing the instrument's keyboard. An instrument of this class is disclosed in my prior Patent No. 2,250,065, in which patent, a loudspeaker is connected to the output circuit of an audio amplifier whose input circuit is provided with a potentiometer or other equivalent well-known impedance regulating device for controlling the magnitude of sound emitted at said loudspeaker.

Volume control devices of the type and for the purpose above stated may be manually operated in any well known manner such as by the foot or the knee of the player. Keyboard musical instruments employing a horizontally movable lever for controlling the volume of sound is disclosed in the Hammond Patent No. 2,203,569.

The invention disclosed in my aforestated patent is a combined piano and electric organ employing means enabling the playing of piano and organ music either separately or together and in various combinations for many versatile musical effects.

It suffices here to say that the herein disclosed invention is an attachment for use particularly with a knee-operated volume or expression control device, whereby said device can be operated either by the knee or the foot of the player as may be found satisfactory for desired rendition of different musical scores. When such a device is used with a piano which requires frequent operation of the pedals of the piano, there are times when it is both convenient to operate the pedals by the foot and simultaneously operate the volume control device by the knee. Musical instruments of the class stated are also frequently provided with a pedal keyboard for sustained bass notes, the same situated generally to the left of the pedals of the piano as shown in the patent to French No. 2,625,070.

An object of the instant invention is the provision of a foot pedal-motion-transferring mechanism adapted to be connected to the control shaft of a knee-operated expression control device to enable the device to be operated as desired either by the knee or by the foot of the player for satisfactory musical expression.

Nothing herein shall be considered as a limitation upon the type of electrical volume control device used in carrying the invention into practice. The device may be of the constructional order of the mechanisms shown in patents, Nos. 1,746,411, 1,920,217, and 2,135,809, or the electrical equivalents of said mechanisms, provided only that the movable controlling element of the mechanism shall have a shaft which is vertically disposed and is free for rotational movement from an "off" condition when the shaft is turned a given degree in one direction to an "on" condition with variations in the volume of sound when the shaft is turned in an opposite direction.

A further important object of the invention resides in the simplicity of the constructional elements employed

and their form and general design enabling attachment of the device to a knee-operated expression control.

A still further object of the invention is the provision of a foot-operated pedal mechanism which may be rigidly connected with the case of a piano so that the motion transferring means of the invention may be properly aligned with a coacting part of a knee-operated expression control.

The invention consists further in the matters hereinafter described and claimed.

In the accompanying drawings:

Figure 1 is a phantom perspective view of a portion of a keyboard musical instrument showing my invention applied to the instrument's knee-operated expression control device;

Figure 2 is a sectional perspective view of the invention showing same disassembled from the control shaft of the knee-operated expression control;

Figure 3 is a perspective view of the shaft coupling; and

Figure 4 is a view partly in elevation and partly in section showing the invention in its operative relationship to the control shaft of the instrument's knee-control device.

In Figure 1 is shown a keyboard musical instrument **10** which may be in form of an upright piano having the customary keyboard **11** supported by bed plank **12** and provided with a vertical kneeboard **13** which forms a continuous part of the case of the instrument. Medially of the opposite ends of the piano are the customary foot-operated pedals **14'**. Supported by the bed plank **12** is a panel structure **14** which constitutes an element in an organization of elements for the electrical generation of sustained musical tones as provided for in my Patent No. 2,250,065. In said patent the input circuit to an audio amplifier is provided with a variable impedance for controlling the volume of sound emitted at the loudspeaker which forms part of an electroacoustical signal translating system. As previously stated, the herein described invention is not to be limited with respect to any specific type of variable impedance employed for controlling the volume of sound. In Figure 4 I show a conventional type of potentiometer **15** which may take the form of any of the aforementioned types of devices of the prior art. For the sake of the invention, it is, therefore, immaterial as to whether the impedance is connected in a circuit controlled by variations in capacitance or by variations in a resistive element. It can be assumed that the potentiometer **15** includes a movable contactor, not shown, and that said contactor may move counter-clockwise to a position where the potentiometer is in an "off" condition or it may move clockwise to any degree and by even increments for "on" conditions of the potentiometer and varying changes in the overall volume of the produced sound. Similarly, the potentiometer may move counter-clockwise for any desired gradual reduction in the overall volume of sound. This contactor is fixed to a depending rotary shaft **16** and fixed to the shaft is a sleeve **17**, the latter having a laterally extending knee-operated lever **17** as shown to advantage at Figures 1 and 2. The volume control device with its lever **17** occupies a position in a vertical plane to the right of the customary pedals **14'** of the piano so that when playing the instrument, the pedals can be operated while operating the lever **17** by the knee. It is preferred that when the lever **17'** is in the position shown in Figure 1, the potentiometer will be in a neutral or "off" condition. To limit rotation of the shaft **16** in an "off" direction, a stop **18** is employed and under the urge of a spring **19**, the shaft is turned to engage said stop.

Referring now more particularly to Figure 2 wherein the invention is shown in detail, **20** designates a flat

metallic plate that can firmly rest upon the floor. Pivoted to swing vertically on the plate is a clamping element **21**. This may be inserted underneath the forward portion of the case of the piano at the bottom thereof, and by means of an adjusting screw **22** carried by the element **21**, the screw may be advanced against the upper surface of the flat plate **21** to elevate the back end of the element and force integral spurs **23** of the element into engagement with the case. Mounted for vertical tilting motion on the base plate **20** is a foot-operated pedal **24**. The mounting means embodies a horizontally disposed rotary shaft **25** having at one end a gear pinion **26** which meshes with a similar gear pinion **27** fixed to the lower end a vertical shaft **28**. The upper end of shaft **28** is secured in the reduced lower end **29** of a sleeve **30**, the latter being telescopically connected with the sleeve **17** and secured thereto to rotate therewith as shown at **31**. Interposed between the base plate **20** and the pedal **24** is a spring **32** which tends normally to urge the pedal to an upwardly inclined or starting position as shown in Figures 1 and 2.

From the foregoing description of the constructional features of the invention, it follows that the shaft **28** may be vertically aligned with the shaft **16** and the latter connected with the former so that both of these shafts will turn at the same time when lateral pressure is applied thereto either by means of the gearing **26—27** or the knee-operated lever **17'**. When the parts are thus connected, the knee-operated lever **17'** may be operated by the knee to adjust the potentiometer and hence the impedance in the circuit of which it is a part or, and if desired, pressure of the foot may be applied to the pedal **24** to rotate the shaft **28** in a clockwise direction and

against the urge of either of the aforementioned springs. When pressure is gradually released from the pedal, the shaft **27** turns counter-clockwise, thus to restore the potentiometer to a neutral condition.

What I claim as my invention is:

1. A foot control for an electrical volume control device of the class applicable to the underside of the bedplank of a piano, which device is provided with a depending volume control element mounted for rotational motion about a vertical axis; said foot control comprising a rigid base, an expression pedal mounted on said base for tilting motion about a horizontal axis, means for supporting said base against movement on the floor and to dispose same to one side of the foot pedals of the piano, and means for imparting rotational motion to said depending volume control element in response to tilting motion of said expression pedal.

2. A foot control according to claim 1, wherein the motion imparting means comprises telescopically connected shafting including a topmost sleeve formed to receive said depending control element and to be fixedly secured thereto.

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