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J. MARKOWITZ

2,205,571

ELECTRONIC PIANO-ORGAN

Filed April 30, 1938

Fig. 1

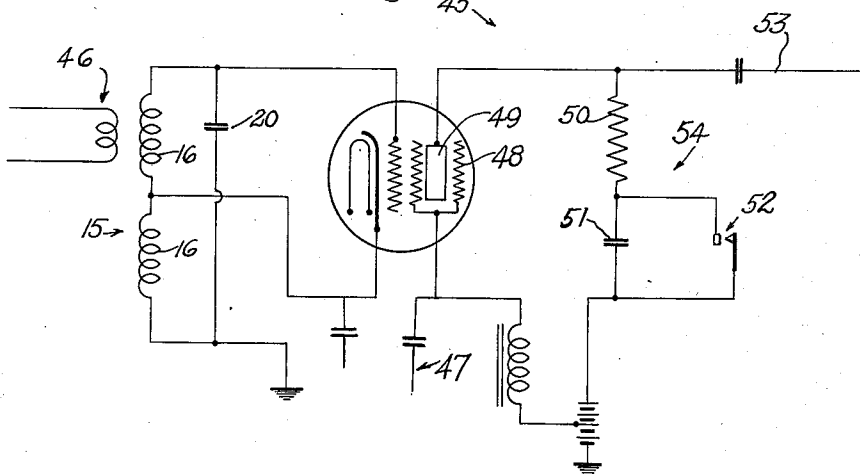
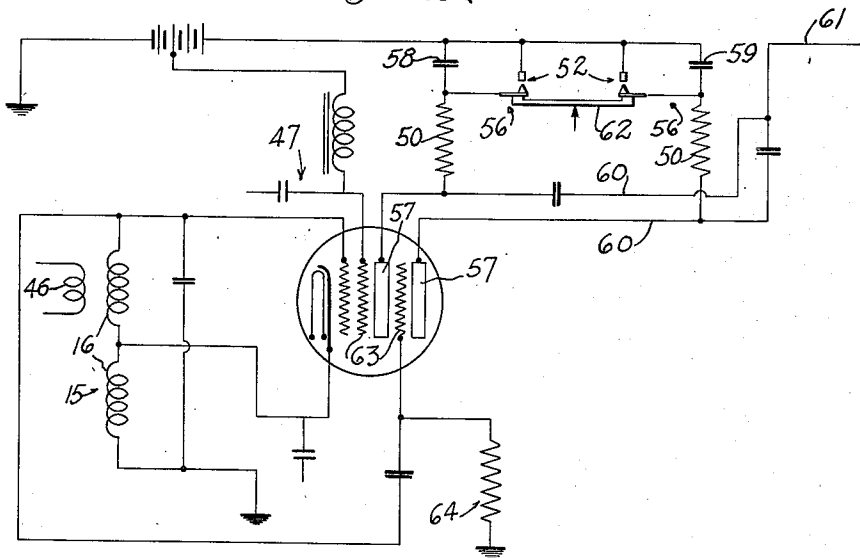


Fig. 2



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ELECTRONIC PIANO-ORGAN

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1 Claim. (Cl. 250—36)

This invention relates to musical instruments and has particular reference to electronic musical instruments employing oscillating tubes.

One object of the invention is the provision of an improved electronic tube operated organ which shall be so small and compact as to be adapted to fit in an ordinary console cabinet.

Another object of the invention is to provide an organ of the type mentioned having improved means for obtaining bell and piano tonal effects from the same tubes that provide the sustained tones.

A further object of the invention is the provision of a device of the character described having few and simple parts, many of which may be of conventional or standard character, and which is compact, inexpensive to manufacture, highly stable, durable, reliable and efficient in use.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claim, and illustrated in the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a diagrammatic view of an embodiment of the invention.

Fig. 2 is a similar view of a modification.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

This application is a continuation in part of my applications as follows: Serial No. 151,349, filed July 1st, 1937, for Electrical musical instruments; Serial No. 171,208, filed October 27th, 1937, now Patent No. 2,140,267, issued December 13, 1938, for Radio tube oscillators; and Serial No. 186,777, filed January 25th, 1938, for Oscillators for electrical musical instruments.

Generally described, the invention provides an electronically operated musical instrument such as an organ having a series of sound generators

such as oscillator units, which may include vacuum tubes.

Referring in detail to the drawing, at 45 is shown a vacuum tube oscillator device for producing a piano effect in an instrument of the character described. The inductance 15 comprising honeycomb coils 16, has associated therewith a condenser 20 of relatively large capacity. The main output of the device may be taken at 46 or 47, with the screen grid 48 actually serving as the plate or main plate. In that sense the plate 49 may be considered as an auxiliary plate, and the inventive feature resides in utilizing the same to produce the tone of the piano effect, because the main output may uninterruptedly continue to normally produce the sustained note. More particularly, the auxiliary plate 49 is connected through a blocking resistor 50 to a condenser 51 which is adapted to be discharged by an instantaneous switch 52. The output circuit for the plate 49 is shown at 53. The parts 49 to 53 may be considered a unit 54 embodied in any suitable organ. Thus a "decaying" tonal effect may be obtained, with the tone dying out as the condenser 51 discharges.

Heretofore condensers have been used to provide "decaying" voltage or tonal effects with separate amplifier tubes. Also it was attempted to produce such effects from the main plate of the oscillator, but this was unsatisfactory because the tube was turned on and off with resulting shock thereto.

At 55 is shown a similar device for producing a bell effect, this device differing from the device 45 primarily in having a plurality of units such as 54, as indicated at 56, in that they have discharge condensers of different capacities, and said units 56 having a common output. Thus different overtones die out at different rates to produce the bell effect. More particularly, the units include auxiliary plates 57 connected through blocking resistors to the respective condensers 58, 59 of different capacities, each unit having an output circuit 60 which are connected into a common output 61, and the condensers 58, 59 having instantaneous switches both actuated simultaneously as at 62 to discharge the condensers 58, 59. In this device, a plurality of grids 63, and a grounded blocking resistor at 64 are provided, as the grid bias is low, the plate voltage used should be low. It will be noted that this arrangement really combines two tubes in one envelope, and that the principle is applicable to the use of two separate tubes.

I claim:

A device including an electrical musical instrument comprising an oscillator having a circuit including a space discharge tube having a cathode, a grid, and a second grid, the latter functioning as the anode, an inductance connected
5 between the said grids, a condenser connected across said inductance, output means for said circuit, to which a constant voltage is applied,

whereby a sustained tone is produced, an auxiliary anode forming part of said tube to provide an electron coupled oscillator, a second output means connected to the auxiliary anode, and means for changing the voltage on said auxiliary
5 anode to control the output signal voltage obtained from the auxiliary anode.

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