

Nov. 14, 1950

L. LUBEROFF
MUSICAL INSTRUMENT

2,530,252

Filed Oct. 11, 1948

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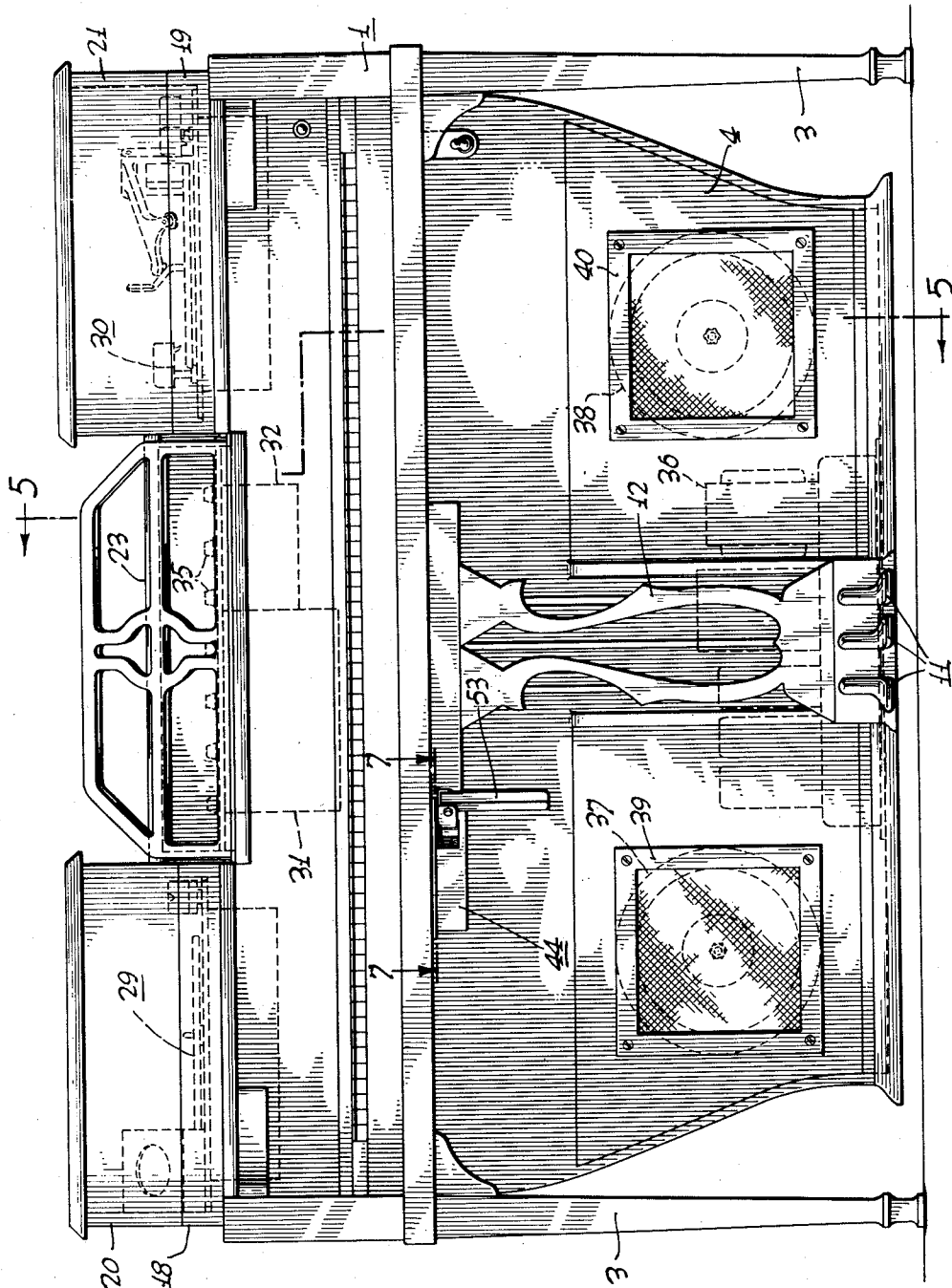


FIG. 1.

Inventor —
Louis Luberoff
by his Attorneys
Howson & Howson

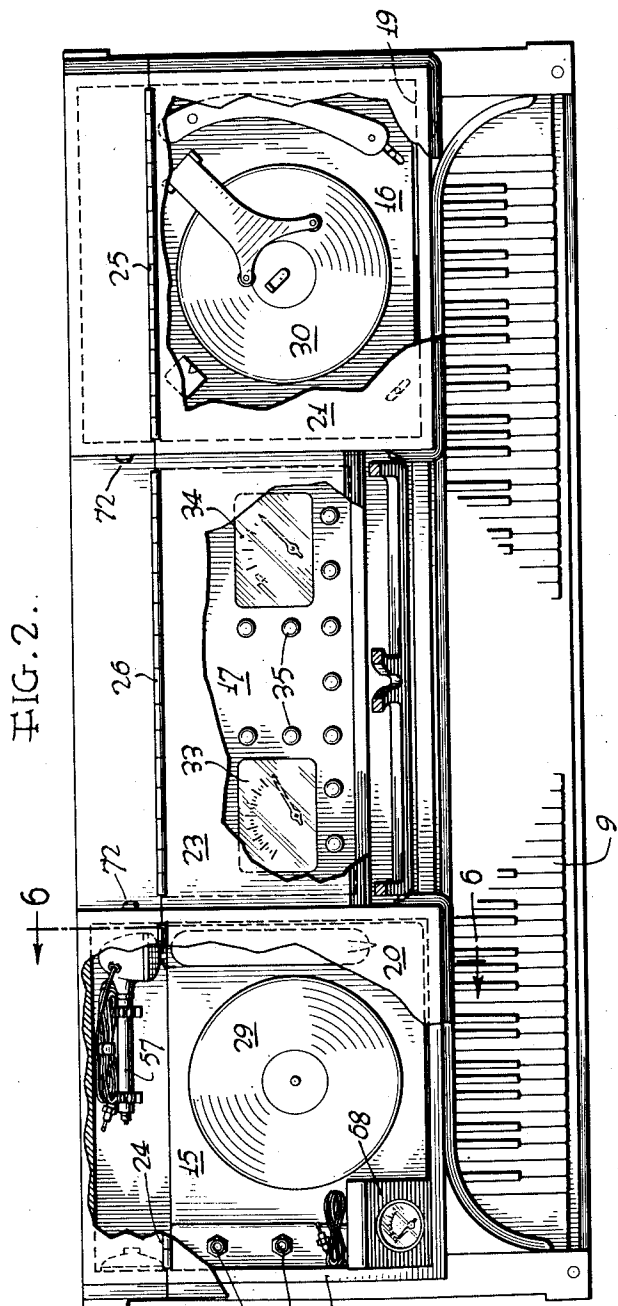
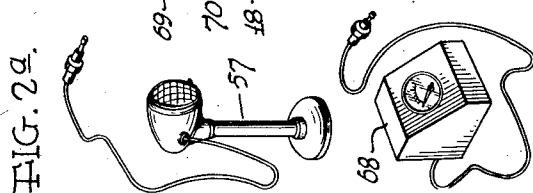
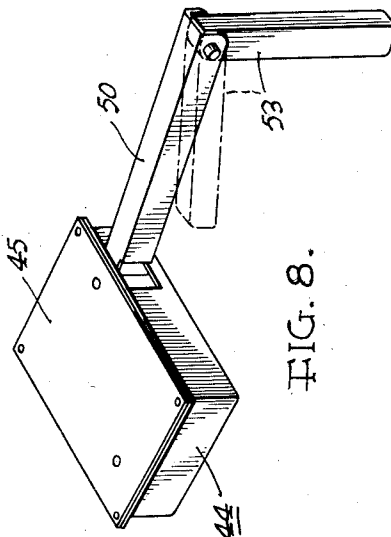
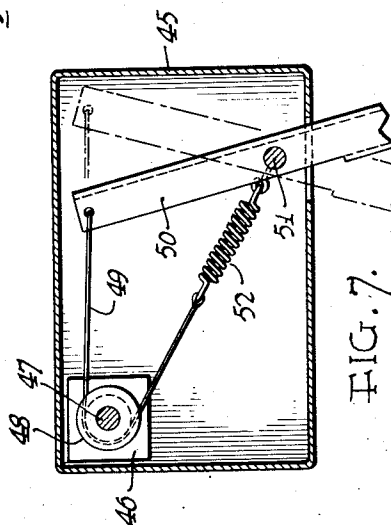
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7 Sheets-Sheet 2



Inventor
Louis Luberoff
by his Attorneys
Howdon &
Howdon

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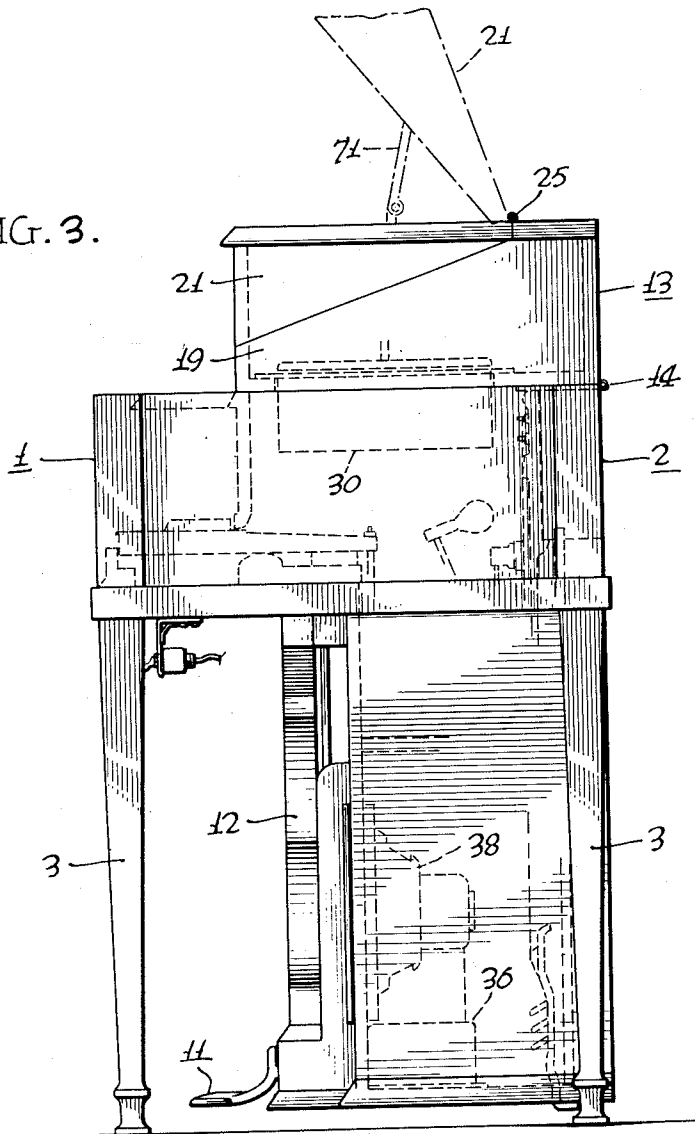
L. LUBEROFF
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7 Sheets-Sheet 3

FIG. 3.



Inventor —
Louis Luberoff
by his Attorneys
Howson & Howson

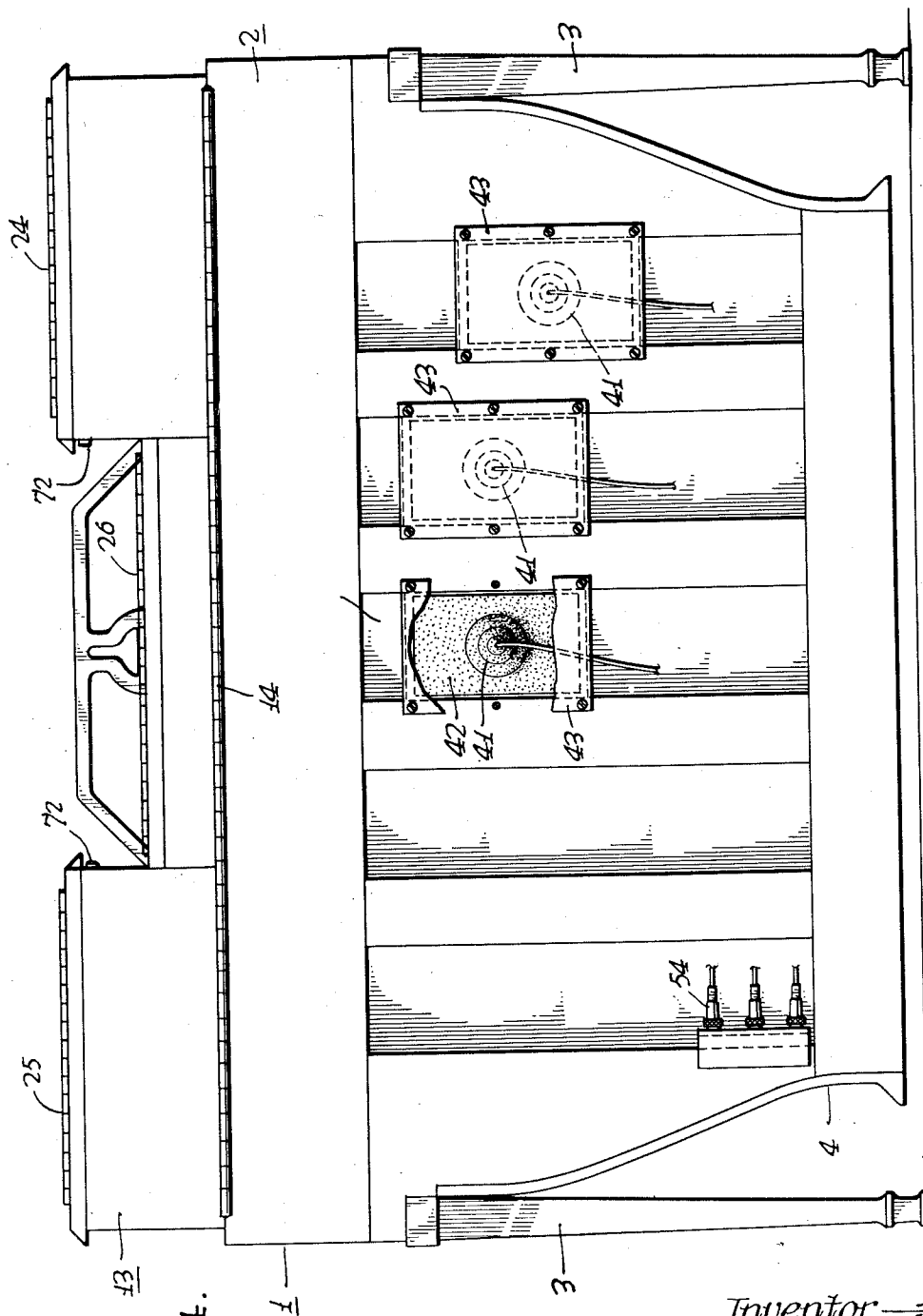
Nov. 14, 1950

L. LUBEROFF
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7 Sheets-Sheet 4



Inventor —
Louis Luberoff
by his Attorneys
Howson & Howson

Nov. 14, 1950

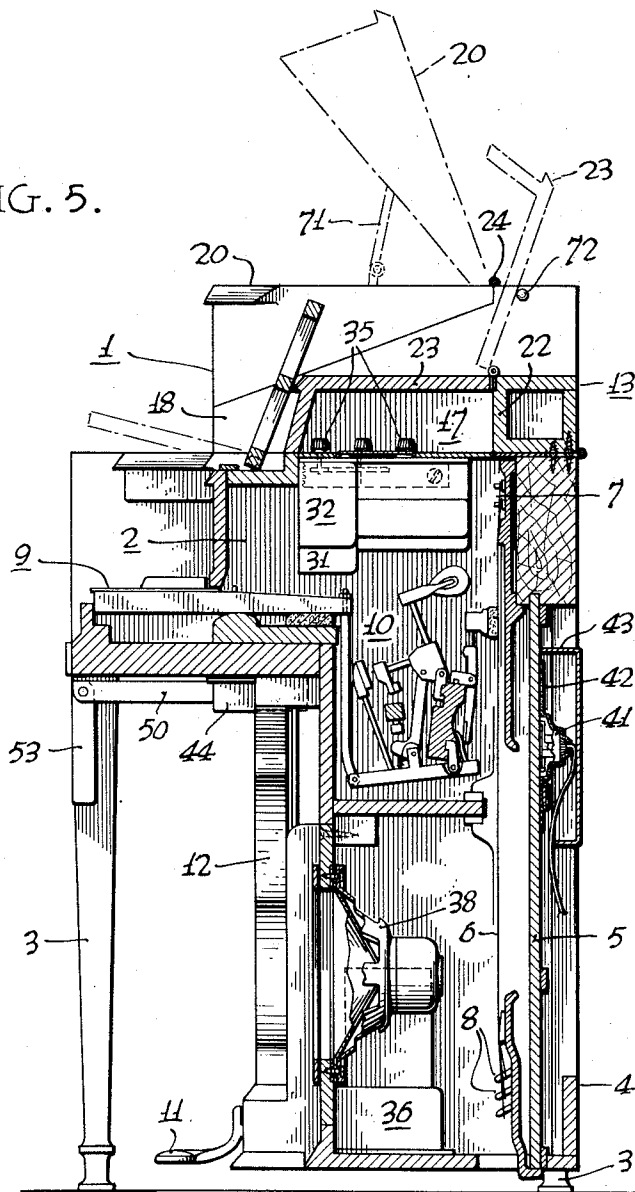
L. LUBEROFF
MUSICAL INSTRUMENT

2,530,252

Filed Oct. 11, 1948

7 Sheets-Sheet 5

FIG. 5.



Inventor —
Louis Luberoff
by his Attorneys
Howson & Howson

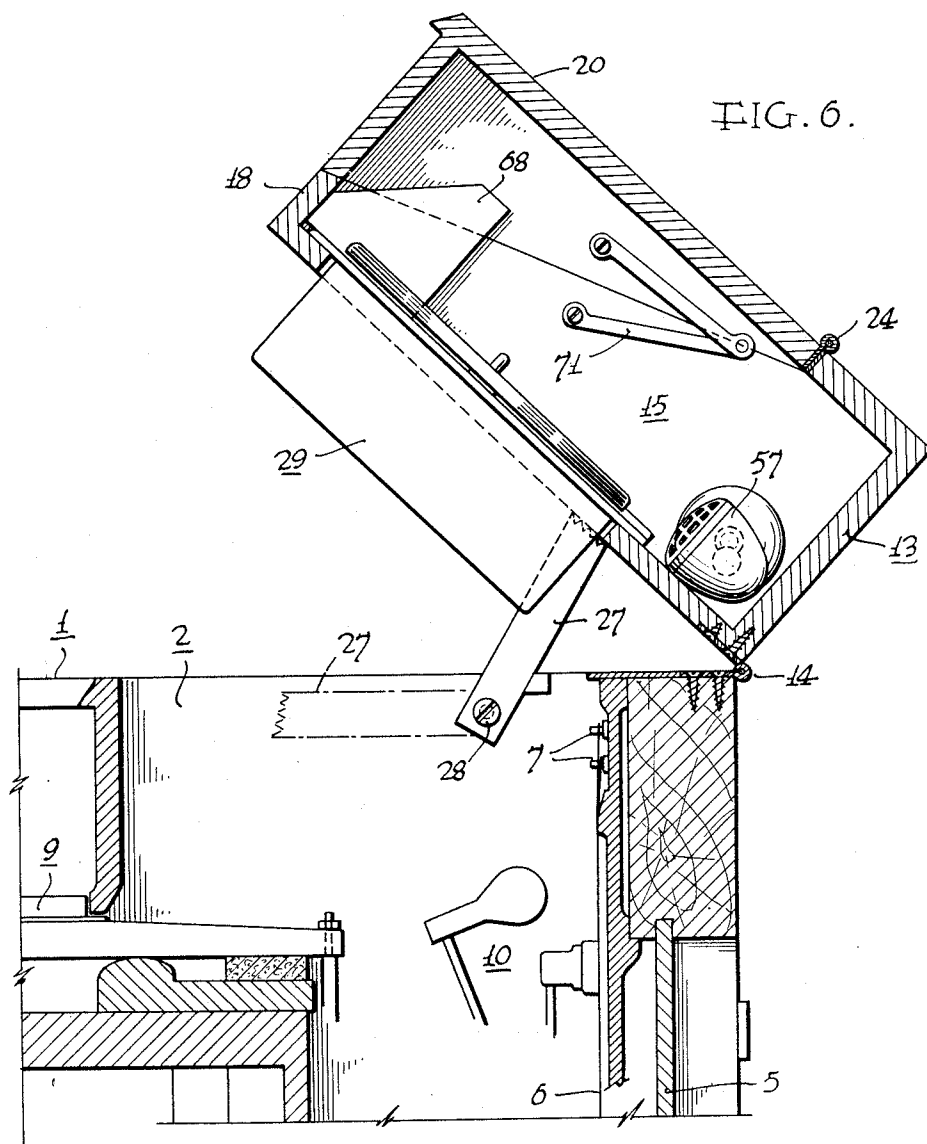
Nov. 14, 1950

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Filed Oct. 11, 1948

7 Sheets-Sheet 6



Inventor —
Louis Luberoff
by his Attorneys
Howson & Howson

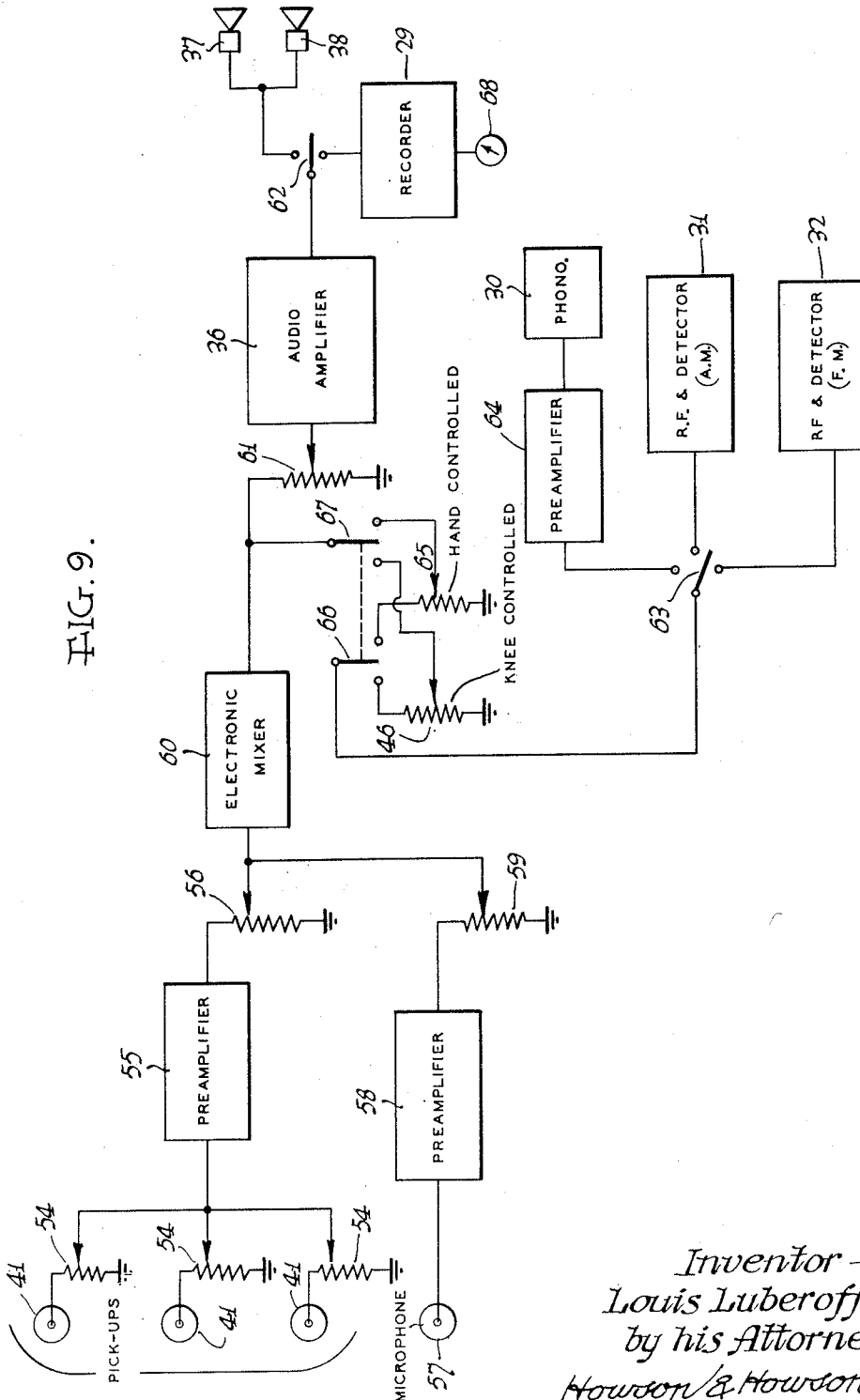
Nov. 14, 1950

L. LUBEROFF
MUSICAL INSTRUMENT

2,530,252

Filed Oct. 11, 1948

7 Sheets-Sheet 7



UNITED STATES PATENT OFFICE

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MUSICAL INSTRUMENT

Louis Luberoff, Jenkintown, Pa.

Application October 11, 1948, Serial No. 53,808

7 Claims. (Cl. 84—1.02)

1

This invention relates to musical instruments, and more particularly to a multi-purpose instrument comprising a piano and other associated devices.

The principal object of the invention is to provide a compact multi-purpose instrument which incorporates all of the various entertainment facilities of most homes within the small space required by a spinet-type piano.

A further object of the invention is to provide a multi-purpose instrument which can be manufactured economically and sold at low cost.

Another object of the invention is to provide a highly versatile instrument which is capable of various uses as hereinafter described.

Still another object of the invention is to provide a spinet-type piano instrument which is adapted to give tone quality and volume normally found only in grand pianos.

Other objects and features of the invention will be apparent from the following detailed description in connection with the accompanying drawings, wherein

Figure 1 is a front elevational view of the multi-purpose piano-type instrument provided by the present invention;

Figure 2 is a plan view of the instrument with certain portions broken away for the purpose of illustration;

Figure 2a is a perspective view of a microphone which is preferably supplied with the instrument;

Figure 2b is a perspective view of a recording instrument also supplied with the instrument;

Figure 3 is a side elevational view of the instrument, with certain of the parts and elements shown in dotted outline;

Figure 4 is a rear elevational view of the instrument;

Figure 5 is a sectional view taken along line 5—5 of Figure 1;

Fig. 6 is a relatively large scale fragmentary sectional view taken along line 6—6 of Fig. 2, with the hinged top structure in raised position;

Fig. 7 is a detail sectional view of the knee-operated volume control device, taken along line 7—7 of Fig. 1;

Fig. 8 is a perspective view of the same volume control device; and

Fig. 9 is a diagrammatic illustration of the electrical system employed in the instrument.

Referring first to Figs. 1 to 6, the musical instrument provided by the invention comprises a spinet-type piano 1, the upper portion of which is of special construction, as hereinafter described in detail. The piano 1 comprises a hollow body

2

designated generally by reference character 2 and serving to contain the usual piano components. The body 2 has supporting legs 3 and a vertically-extending section 4 at the rear of which is disposed the usual sounding board 5 having vertically-extending strings 6 mounted thereon by means of the usual upper and lower pins 7 and 8. The usual keyboard is represented generally at 9, the keys serving to actuate the usual striking devices, one of which is clearly visible in Fig. 5 and is designated generally by reference character 10. The piano further comprises the usual pedals 11 and pedal support 12.

In accordance with the present invention, the piano body 2 is provided with a hinged top structure designated generally by reference character 13, said structure extending substantially the full width of the piano and being hinged at the rear as shown at 14. The said top structure is formed so as to provide two similar lid-covered compartments 15 and 16 at the side portions of said top structure, and also to provide a relatively shallow lid-covered compartment 17 located centrally between the first-mentioned compartments. To this end, the top structure 13 is so constructed that it comprises similar box-like enclosures 18 and 19 having lids 20 and 21, respectively, which enclosures form the above-mentioned side compartments 15 and 16. The central part of said top structure is constructed so as to provide a stationary back panel 22 (see Fig. 5) and a lid or cover 23 so as to form the relatively shallow central compartment 17. All three of the lids or covers of the three compartments above mentioned are hinged at the rear by means of the respective hinges 24, 25 and 26.

The purpose of the compartmented top structure is to accommodate devices in association with the piano as hereinafter described. It is important to note, however, that the entire top structure may be raised about its hinge 14, as shown in Fig. 6, to afford access to the upper pins 7 and to the striking mechanism. On each side of the panel body 2, there is provided a pivotally-mounted prop 27, as shown in Fig. 6, which is pivoted at 28 and is normally disposed in the dot-and-dash position but is movable to the solid line position to hold the lid structure 13 in a raised position as shown. When the top structure is thus disposed, the top of the piano body is open throughout the width, thus affording access to the internal mechanism. This arrangement is important as it enables ready access to the pins 7 for tuning of the piano and also enables ready access to the operating mechanism of the piano

for repair or replacement of parts. When the top structure 13 is in its normal lowered position, as shown in Figs. 1 to 5, access may be had to any one of the three compartments above mentioned simply by raising the lid of that compartment.

In the specific form of the multi-purpose instrument illustrated, the compartment 15 is utilized to house a recorder represented generally by reference character 29, and the compartment 16 is utilized to house a phonograph represented generally by reference character 30. However, it is to be understood that these compartments may be utilized to accommodate any device which is capable of association with the piano body. The central compartment 17 is preferably employed to accommodate controls and tuning indicators for radio receiving equipment. In the instrument as illustrated such equipment comprises both amplitude modulation and frequency modulation sections. The radio frequency and detector equipment for both sections is suspended from the top structure 13 immediately below the central compartment 17. In Figs. 1, 5 and 6, the radio frequency and detector unit for the amplitude modulation section is represented in outline at 31, while the radio frequency and detector unit for the frequency modulation section is represented in outline at 32. Referring particularly to Fig. 2, there are two tuning dials 33 and 34 within the compartment 17 for the amplitude modulation section and the frequency modulation section, respectively. Also disposed within compartment 17 are the various manual control knobs designated generally by reference character 35. Located at the bottom of the hollow section 4 of the piano body, preferably centrally of said section, is an audio amplifier and power supply unit 36 which serves to amplify various sound currents as will appear later. A pair of sound reproducers or loud-speakers are disposed at the bottom of the hollow section 4 on opposite sides of unit 36. The sounds produced by the two loud speakers are emitted through grille-covered openings 39 and 40 at the front of the hollow section 4.

As hereinafter described with reference to the electrical diagram of Fig. 9, provision is made for producing sounds from the piano electronically as well as mechano-acoustically. As shown in Fig. 4, there are provided on the back of the sounding board 5 a plurality of electrical pick-up devices 41 which preferably take the form of conventional electromagnetic pick-up devices. These pick-up devices may be secured to the sounding board in any suitable manner, for example by means of an adhesive material 42 known as "Emplastrum Resine." This method of securing pick-up devices to a piano sounding board is more fully disclosed in my copending application, Serial No. 609,747, filed August 9, 1945. A cover plate 43 is provided for each of the pick-up devices. Any number of pick-up devices may be employed, there being three in the illustrated embodiment.

As also described later with reference to the electrical diagram of Fig. 9, provision is made for playing the piano in accompaniment with either the phonograph or the radio receiver. To enable control of the volume of the latter devices while playing the piano, there is provided a knee-operated volume control device 44 which is mounted on the piano in proper location. As shown in Figs. 7 and 8, this device comprises a casing 45 within which there is a conventional volume control device 46 having a rotatable shaft

47. A pulley 48 on said shaft is engaged by a flexible cord 49 attached to a lever 50 which is pivoted at 51 within the casing 45. A spring 52 serves to keep the cord 49 taut. A knee-engageable arm 53 is pivotally attached to the outer end of lever 50 and is disposable in operative and inoperative positions as shown in Fig. 8. When the arm 53 is in the operative position shown in solid line representation, it is engageable by the left knee of the person playing the piano.

Referring now to Fig. 9, there is shown a simplified illustration of the electrical system employed. Since all of the parts shown are conventional, they are symbolically represented. The piano pick-up devices 41 are connected to individual volume control potentiometers 54 which are located on the back of the piano, as may be seen in Fig. 4. When once adjusted, these are seldom, if ever, readjusted. The pick-ups feed through their respective potentiometers to a common preamplifier 55, the output of which is supplied to an adjustable volume control potentiometer 56. A microphone 57 is preferably supplied with the instrument and when used feeds into a preamplifier 58, whose output is supplied to an adjustable volume control potentiometer 59. The outputs of the piano pick-ups and the microphone are supplied to a common conventional mixer 60, whose output is supplied to a master volume control potentiometer 61. The latter feeds into the audio amplifier 36, whose output may be supplied through selecting switch 62 either to the loud-speakers 37 and 38 or to the recorder 29.

The phonograph 30 and the AM and FM radio sections 31 and 32 are selectable by a three-position switch 63. A preamplifier 64 is provided for the phonograph. The switch 63 is connected to a combination hand-knee volume control arrangement which includes the previously-mentioned knee-operated volume control potentiometer 46, and also a hand-operated volume control potentiometer 65. These two potentiometers are connected as shown to ganged switches 66 and 67 which are controlled by one of the control knobs 35 as shown in Figure 2. When the two ganged switches are in the left-hand position, the knee-controlled volume control device is operative, and when the switches are in the right-hand position, the hand-controlled volume control device is operative. Depending upon the position of switch 63, any one of the devices selectable thereby may be connected to the input of the audio amplifier through either of the volume control devices 46 and 65. The audio amplifier 36 serves to amplify the audio signal from any one of the devices which are selectable by switch 63. It will be apparent also that the audio amplifier amplifies the audio signals from the piano pick-ups and from the microphone.

By means of the electrical system shown in Fig. 9, the piano may be operated electronically to augment the sounds produced mechano-acoustically. This greatly improves the tone quality and increases the volume of the piano. It is also possible to use the microphone to pick up sounds produced by the piano sounding board and to amplify such sounds, thus augmenting the electronic operation. Furthermore, the piano may be played as an accompaniment to either the phonograph or the radio, and the volume of the latter devices may be manually set or may be controlled by the knee of the operator. Fur-

ther still, the microphone permits a voice accompaniment. In any case, the audio output of amplifier 36 may be reproduced through the loudspeakers 37 and 38 or may be recorded on a record through the use of the recorder 29. It will be seen, therefore, that the entire instrument is highly versatile and is capable of various uses.

As shown in Fig. 2, provision may be made for supporting the microphone 57 within the recorder compartment 15. A recording meter 68 may also be provided and may be stored within the recorder compartment. Jack receptacles 69 and 70 may be provided in said compartment for plugging in the microphone and the recording meter.

As previously described, the three compartments at the top of the instrument are individually accessible by raising the respective lids thereof. Suitable provision is made for maintaining each lid in its raised position. The lids of the side compartment each may have associated with it an ordinary link-type prop arrangement 71, while the lid of the central compartment may have an associated stop 72 against which it may rest.

As previously mentioned, the compartments at the top of the instrument may be utilized in any desired manner. For example, a combined phonograph and recorder could be housed within one of the side compartments, and the other side compartment could be utilized to house television equipment. In such case, the latter compartment could be used to accommodate the picture projection elements of a television receiver and the other components of the receiver could be mounted in the same fashion as is the radio equipment in the illustrated embodiment. The audio signal from the detector in the sound channel could be supplied to the audio amplifier 36.

From the foregoing description, it will be apparent that the invention is not limited to the particular structure shown but is capable of various modifications.

I claim:

1. In a multi-purpose musical instrument, a spinet-type piano including a hollow body containing the piano mechanism, a hinged top structure on said body extending substantially the full width of the piano and affording access to the piano mechanism inside said body, a pair of lid-covered compartments on said top structure at the side portions thereof, each of said compartments being adapted to house a device in association with the piano, a relatively shallow lid-covered compartment on said top structure between the first-mentioned compartments, broadcast receiving equipment suspended from said top structure below the last-mentioned compartment, and control elements for said equipment disposed within the last-mentioned compartment and accessible by raising the lid of such compartment.

2. In a multi-purpose musical instrument, a spinet-type piano comprising a hollow body containing the piano mechanism including a sounding board, a hinged top structure on said body extending substantially the full width of the piano and affording access to the piano mechanism inside said body, a first lid-covered compartment on said top structure, a phonograph in said compartment, another lid-covered compartment on said top structure, radio-receiving equipment suspended from said top structure below the last-mentioned compartment, control elements for said equipment disposed within the

last-mentioned compartment and accessible by raising the lid of such compartment, and means for electrically reproducing sounds from said sounding board and from either the phonograph or the radio-receiving equipment.

3. In a multi-purpose musical instrument, a spinet-type piano comprising a hollow body containing the piano mechanism including a sounding board, a hinged top structure on said body extending substantially the full width of the piano and affording access to the piano mechanism inside said body, a first lid-covered compartment on said top structure, a phonograph in said compartment, another lid-covered compartment on said top structure, radio-receiving equipment suspended from said top structure below the last-mentioned compartment, control elements for said equipment disposed within the last-mentioned compartment and accessible by raising the lid of such compartment, means for electrically reproducing sounds from said sounding board and from either the phonograph or the radio-receiving equipment, and knee-controlled volume control means arranged to control the amplitude of the sound reproduced from either the phonograph or the radio-receiving equipment.

4. In a multi-purpose musical instrument, a spinet-type piano comprising a hollow body containing the piano mechanism including a sounding board, a hinged top structure on said body extending substantially the full width of the piano and affording access to the piano mechanism inside said body, a first lid-covered compartment on said top structure, a phonograph in said compartment, another lid-covered compartment on said top structure, radio-receiving equipment suspended from said top structure below the last-mentioned compartment, control elements for said equipment disposed within the last-mentioned compartment and accessible by raising the lid of such compartment, means for electrically reproducing sounds from said sounding board and from either the phonograph or the radio-receiving equipment, and selectable knee and hand-controlled volume control means arranged to control the amplitude of the sound reproduced from either the phonograph or the radio-receiving equipment.

5. In a multi-purpose musical instrument, a spinet-type piano comprising a hollow body containing the piano mechanism including a sounding board, a hinged top structure on said body affording access to the piano mechanism inside said body, an electrical sound reproducing system within the piano body connected to said sounding board, a phonograph mounted on said top structure and connectable to said system for reproduction of sounds from the phonograph, manual controls on the upper part of said body for both said system and said phonograph, and knee-controlled volume control means arranged to control the amplitude of sound reproduced from the phonograph and operable between zero and maximum output.

6. In a multi-purpose musical instrument, a spinet-type piano comprising a hollow body containing the piano mechanism including a sounding board, a hinged top structure on said body affording access to the piano mechanism inside said body, an electrical sound reproducing system within the piano body connected to said sounding board, a phonograph mounted on said top structure and connectable to said system for reproduction of sounds from the phonograph, knee-con-

7

trolled volume control means arranged to control the amplitude of sound reproduced from the phonograph and operable between zero and maximum output, a recorder mounted on said top structure and connectable to said system, and manual controls on the upper part of said body for said system, said phonograph and said recorder.

7. In a multi-purpose musical instrument, a spinet-type piano comprising a hollow body containing the piano mechanism including a sounding board, a hinged top structure on said body affording access to the piano mechanism inside said body, an electrical sound reproducing system within the piano body connected to said sounding board, a phonograph mounted on said top structure at one side thereof and connectable to said system for reproduction of sounds from the phonograph, knee-controlled volume control means arranged to control the amplitude of sound

8

reproduced from the phonograph and operable between zero and maximum output, a recorder mounted on said top structure at the other side thereof and connectable to said system, and manual controls for said system, said phonograph and said recorder, said controls being mounted on the central portion of said top structure.

LOUIS LUBEROFF.

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The following references are of record in the file of this patent:

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