Dec. 15, 1936. J. H. HAMMOND, JR 2,064,305

EDITING FOR VOICE RECORDING

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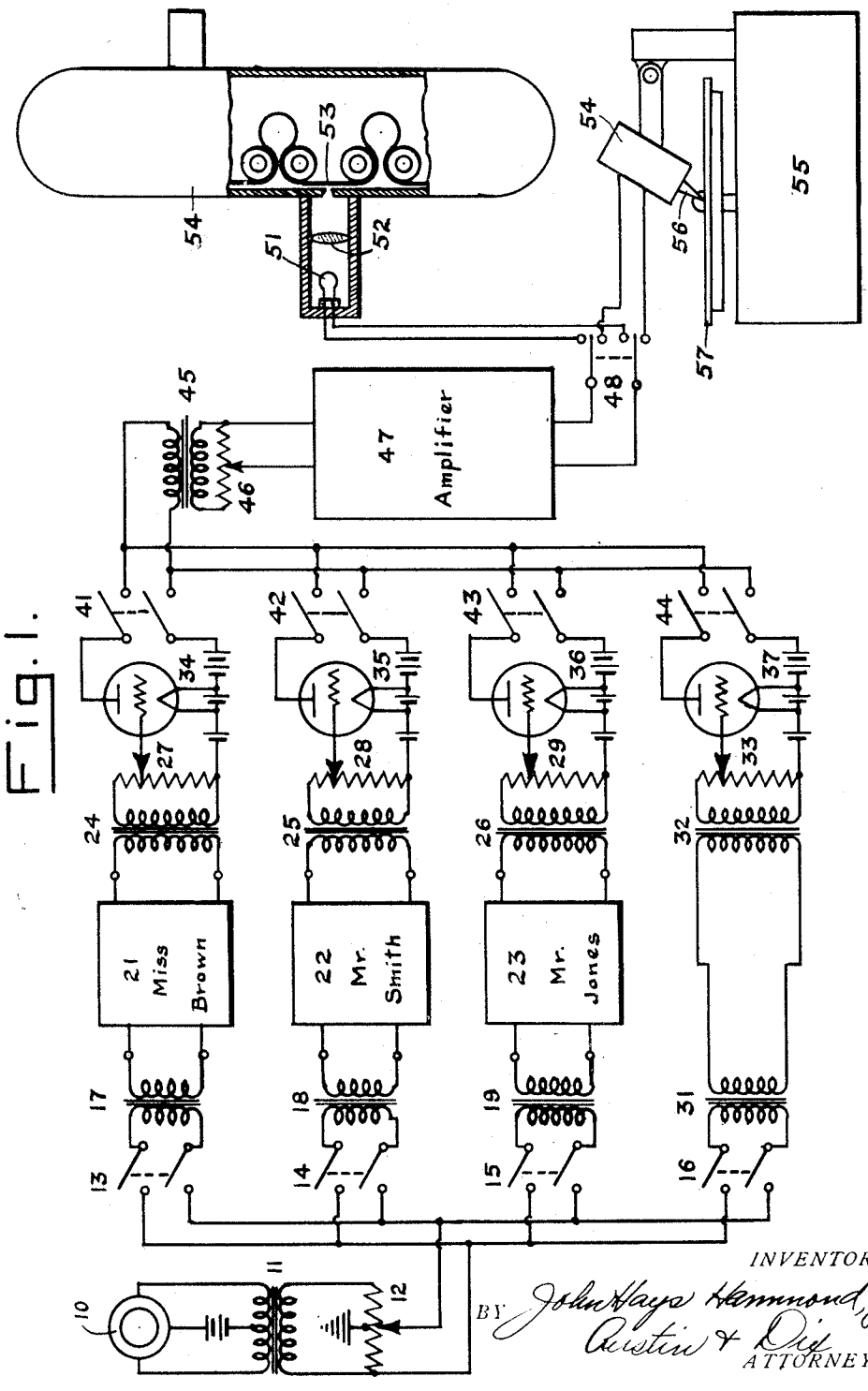


Fig. 1.

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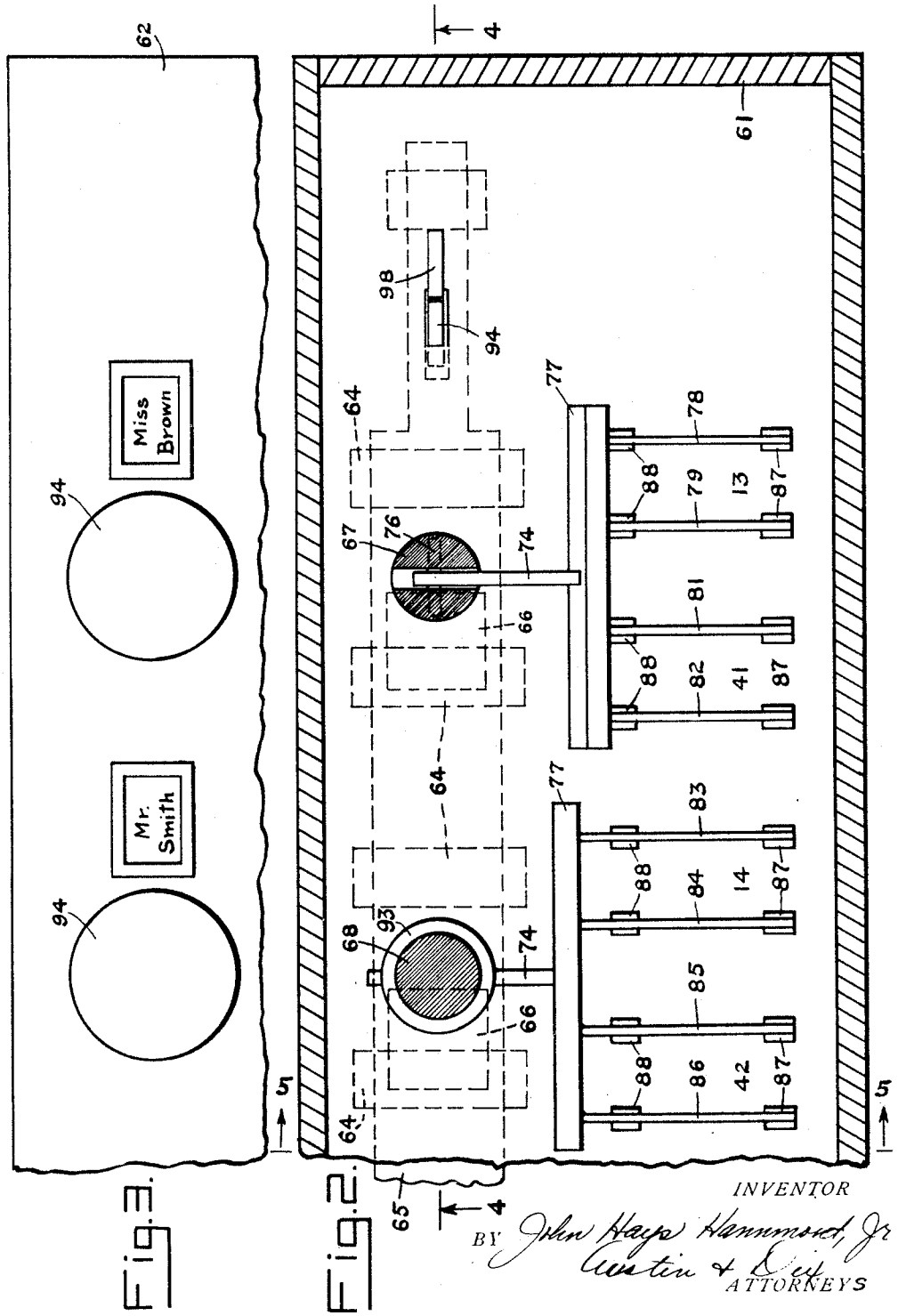


Fig. 3.

Fig. 2.

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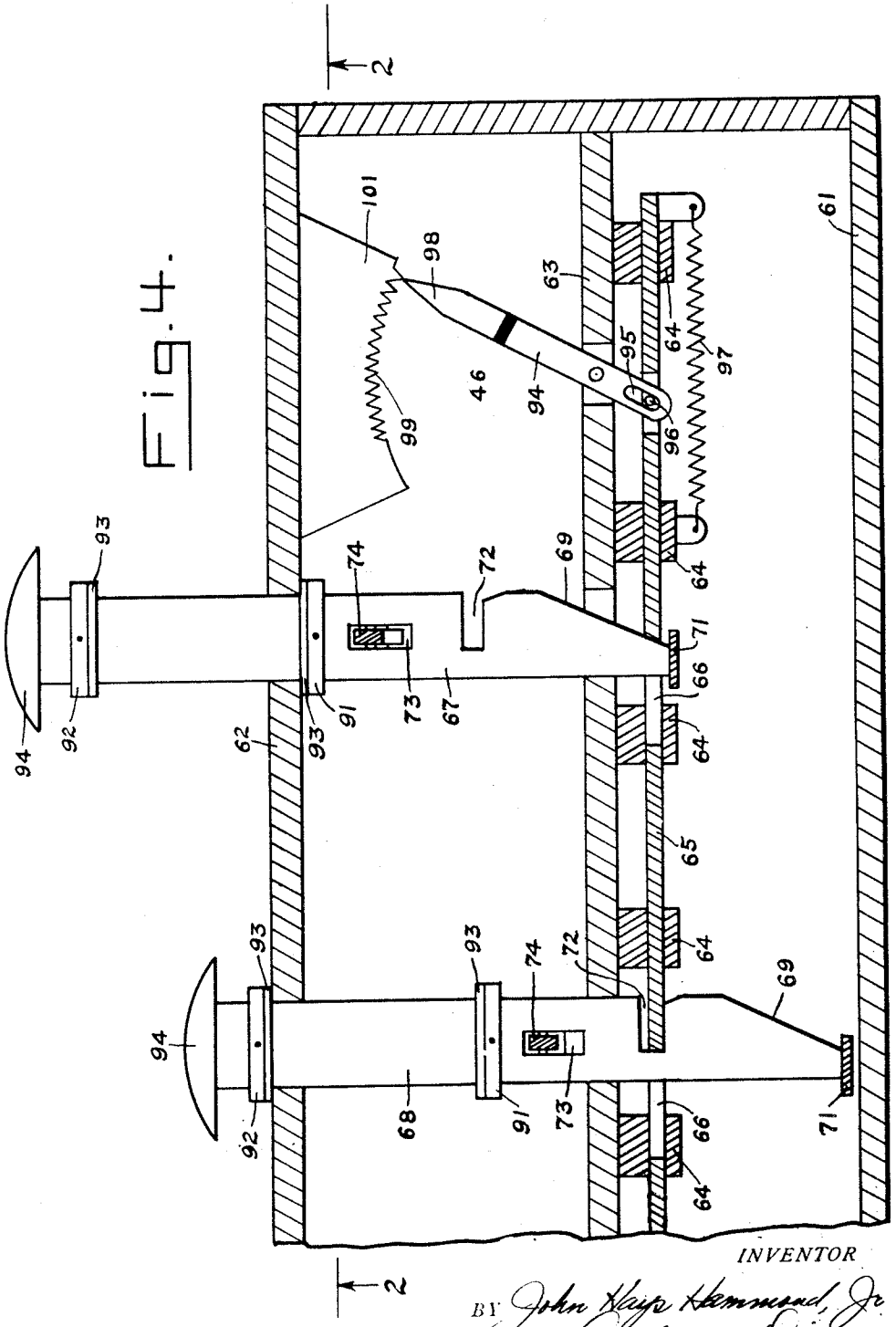
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Fig. 4.



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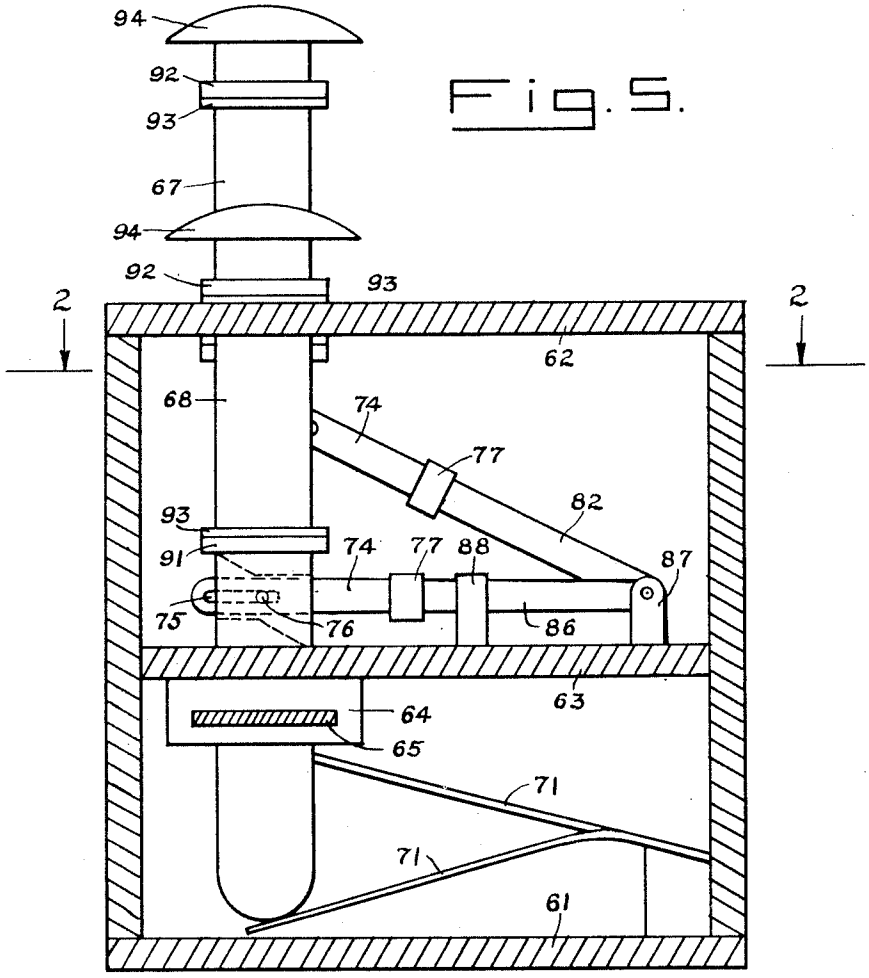
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EDITING FOR VOICE RECORDING

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Fig. 5.



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Patented Dec. 15, 1936

2,064,305

UNITED STATES PATENT OFFICE

2,064,305

EDITING FOR VOICE RECORDING

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Application December 21, 1933, Serial No. 703,428

8 Claims. (Cl. 179—100.1)

This invention relates to sound recording, and more particularly to a system for editing the sounds before recording.

According to a preferred form of the invention, the sound recording system comprises a plurality of parallel paths between the recording microphone and the recording instrument. Each path may have a filter for filtering out unpleasant qualities in a particular type of voice. In this way different types of voices are given different treatment so that their most pleasing qualities only are transmitted, undesirable qualities being suppressed.

If desired, suitable interlocking switching devices may be provided for instantly placing any desired filter in operation and cutting out the remaining filters. A suitable potentiometer may be provided in each path for automatically cutting down the transmission of sound energy during the switching operation to prevent the recording of unpleasant noises caused by the operation of the switching devices.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 illustrates diagrammatically the invention as applied to the recording of sound on a photographic film or a phonograph record.

Fig. 2 is a plan view partly in section (taken on line 2—2 of Fig. 4) of the switching mechanism used in connection with the invention.

Fig. 3 is a fragmentary view of the control panel.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2.

Like reference characters denote like parts in the several figures of the drawings.

In the following description and in the claims, parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Referring to the accompanying drawings and more particularly to Fig. 1, a microphone 10 is connected through a transformer 11, to a potentiometer 12, the other side of which is connected to the contacts of a plurality of switches 13, 14, 15 and 16. The blades of the switches 13, 14 and 15 are connected through a plurality of transformers 17, 18 and 19, to a plurality of filter circuits 21, 22 and 23, the other sides of which are connected through a plurality of transformers 24, 25 and 26 to a plurality of potentiometers 27, 28 and 29. The blades of the switch 16 are connected through two transformers 31 and 32 to a potentiometer 33. The other sides of the potentiometers 27, 28, 29 and 33 are connected to the input circuits of a plurality of amplifiers 34, 35, 36 and 37, the output circuits of which are connected to the blades of a plurality of switches 41, 42, 43 and 44.

The contacts of all these switches are connected in parallel to the primary of a transformer 45, the secondary of which is connected to a potentiometer 46, the other side of which is connected to the input circuit of an amplifier 47. The output circuit of this amplifier is connected to the blades of a double-pole double-throw switch 48. One set of contacts of this switch are connected to a variable intensity lamp 51, the light from which is focused by a lens 52 upon the sound record of a moving photographic film 53 of a moving picture camera 54. The other contacts of the switch 48 are connected to an engraving mechanism 54 of a phonograph recording mechanism 55. The engraving mechanism 54 is provided with an engraving tool 56 which engraves the sound vibrations upon a record 57.

In the operation of the form of the invention shown in Fig. 1, each of the filter circuits 21, 22 and 23 are designed for use with a particular artist so as to compensate for any undesirable qualities of the artist's voice. These filter circuits are of well-known and standard construction for this type of work, and need not be more fully described herein. When a certain artist is speaking or singing, only the switches corresponding to the filter circuit to be used with this artist are closed, thus for example, if a Mr. Smith is singing and the filter circuit 22 has been designed for use in connection with his voice, the switches 14 and 42 are closed so that the vibrations which are picked up by the microphone 10 pass through the filter circuit 22 where they are modified in a well-known manner, in order to produce the best results for recording. These vibrations then pass through the potentiometer 28 where any desired amount of energy may be picked up and fed to the amplifier 35. The en-

ergy is here amplified and passed through the transformer 45 and potentiometer 46 to the amplifier 47, where it is further amplified. If the switch 48 is up the amplified energy will cause the lamp 51 to fluctuate in intensity, thereby producing a photographic sound recording of the singer's voice on the film 53. If the switch 48 is down, the amplified energy will actuate the phonograph engraving mechanism 54 and thus engraving a record of the singer's voice upon the phonograph record 57.

If another artist, for example Miss Brown, is singing, the switches 14 and 42 will be opened, and the switches 13 and 41, for example, will be closed, thus throwing in the filter 21, which has been designed for use in connection with Miss Brown's voice. It may thus be seen that when any artist is speaking or singing it is possible to compensate for any undesirable qualities in his voice by throwing in the proper filter circuit during the time that this artist's voice is being recorded. It is, therefore, necessary to have as many filter circuits as there are artists recording on one program.

If another group of artists are to make a record at a different time, however, it is possible, of course, to remove the filter circuits 21, 22 and 23 and replace them by another group of filter circuits which have been designed for the new set of artists. If, on the other hand, it is desired to use direct recording without the use of any filter circuit, only the switches 16 and 44 are closed, thereby connecting the microphone 10 to the amplifier 37, and eliminating any filter circuit action.

During recording, the switching from one filter circuit to another must be very rapid to take care of dialogue between a number of people in which first one person speaks and then another in rapid succession. The switching mechanism shown in Figs. 2 to 5 is provided for this purpose. This mechanism consists of a casing 61 which is provided with a panel 62 and a partition 63. Secured to the under surface of this partition are a plurality of brackets 64, in which slides a plate 65, which is provided with a plurality of rectangular openings 66. Slidably mounted in the partition 63 and the panel 62 are a plurality of plungers such as 67 and 68. Each of these plungers is provided with a sloping surface 69 which engages one side of one of the openings 66 in the plate 65. The plungers are normally held in the up positions by means of springs 71 which engage the lower ends of these plungers. The plungers are also provided with slots 72 and 73. Passing through the slots 73 are bars 74 having slots 75 in which slide pins 76 carried by the plungers 67, 68, etc. Secured to the bars 74 are members 77 made of insulating material. Secured to the members 77 are switch blades 78 to 86 which are pivoted to brackets 87 carried by the partition 63 and cooperate with contacts 88, also carried by this partition. Secured to each plunger 67, 68 etc. are two collars 91 and 92 to which are attached washers of rubber or some other resilient material 93. Fastened to the top of the plungers 67, 68 etc. are handles 94 for operating same.

Pivoted to the partition 63 is an arm 94, the lower end of which is provided with a slot 95 in which slides a pin 96 carried by the plate 65. This plate is held in the position shown in Fig. 4 by means of a spring 97. Secured to but insulated from the upper end of the arm 94 is a contact 98 which slides over a resistance 99 carried by a bracket of insulating material 101.

In the operation of the switching mechanism shown in Figs. 2–5, the switch blades 78—79, 81—82, 83—84, 85—86 etc. correspond to the switches 13, 41, 14, 42 etc. of Fig. 1, and the resistance 99 and the sliding contact 98 correspond to the potentiometer 46 of this figure.

When Mr. Smith, for example, is speaking the plunger 68 is depressed as shown in the figures, the switches 83—84, 85—86 which as already stated correspond to the switches 14 and 42 of Fig. 1 are thus closed. As long as he continues to speak or sing the switching mechanism is left in the position shown. If he stops and Miss Brown, for example, starts to speak the plunger 67 is depressed by an attendant just before she speaks. The depression of plunger 67 thus causes the plate 65 to be moved to the right, due to the action of the inclined surface 69 against the side of the hole 66 in the plate 65. As this plate moves to the right it will cause the contact 98 to be moved to the left over the resistance 99, thereby cutting down the energy picked up by the potentiometer 46. This action continues until the contact 98 has moved entirely across the resistance 99, at which time the plate 65 will have been moved to the right a sufficient amount so that it is disengaged from the slot 72 of the plunger 68, thus allowing this plunger to move upwardly under the action of its spring 71. As it does so it will open the switches 14 and 42. As the plunger 67 continues to move downwardly it will then close the switches 13 and 41 so that the filter 22 is thrown out of the circuit, and the filter 21 thrown in. When the plunger 69 has reached its lowest position determined by the stop 92 coming against the panel 62, the plate 65 will slide into the slot 72 of this plunger, thus allowing the plate 65 to be moved to the left into the position shown in Fig. 4, under the action of the spring 97. This will cause the contact 98 to be moved rapidly over the resistance 99 to the position shown in this figure, so that the full amount of energy is picked up by the potentiometer 46.

It is thus seen that by depressing the plunger corresponding to the person who is starting to speak at a certain moment, the filter of any other person will be automatically thrown out of the circuit, and the filter of the person starting to speak will be thrown in. At the same time, the potentiometer 46 is rapidly moved to zero and back again, so that there will be no clicks produced in the record, due to the opening and closing of the switches. This procedure can be done very rapidly by pushing on the appropriate plunger so that an attendant watching the scene being filmed can quickly throw the desired filters in and out as the different people acting the scene start speaking.

Although only a few of the various forms in which this invention may be embodied have been shown herein, it is to be understood that the invention is not limited to any specific construction, but might be embodied in various forms without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. A sound recording system comprising a pick-up device, an amplifier, a plurality of filter circuits, a series of switches for connecting said pick-up device to any one of said filter circuits, a second series of switches for connecting any one of said filter circuits to said amplifier, recording means for recording the output of said amplifier on a sound record, and means for simultaneously closing the corresponding switches of

any filter circuit and at the same time opening any of the other switches which may be closed.

2. A system for the recording of sound including in a circuit a sound pick-up device, an amplifier and a sound recorder, a plurality of filters and switching means for connecting any one of said filters into said circuit and at the same time disconnecting any other filter that may be in the circuit at that time.

3. A system for the recording of sound including in a circuit a sound pick-up device, a potentiometer, an amplifier and a sound recorder, a plurality of filters, switching means for connecting any one of said filters into said circuit and at the same time disconnecting any other filter that may be in the circuit at that time, and means coacting with said switching means for causing said potentiometer to reduce the input to the amplifier during the time of operation of said switching means.

4. A system for the recording of sound including in a circuit a pick-up device, an amplifier and a means for recording the output of said amplifier on a sound record, a plurality of filters, groups of switches for connecting any one of said filters into said circuit and means for operating said groups of switches so that when any one of said groups is closed all the other groups will be opened.

5. A system for the recording of sound including in a circuit a pick-up device, an amplifier and a means for recording the output of said amplifier on a sound record, a plurality of filters, groups of switches for connecting any one of said filters into said circuit, means for operating said groups of switches so that when any one group is closed all the other groups will be opened, and means for reducing the input to said amplifier when the switches are being operated.

6. In combination, a plurality of switches, a potentiometer, control means for closing any one of said switches and at the same time opening any other of said switches which may be closed and means operated by said control means for operating said potentiometer simultaneously with the operation of said switches.

7. In a sound recording system, a recording circuit comprising a sound pick-up device, an amplifier and a recording device, a plurality of filters and a switching mechanism responsive to a single manual operation for connecting any one of said filters into said recording circuit and disconnecting any other of said filters in the circuit.

8. In a sound recording system for recording selections having different tone qualities, a recording circuit comprising a sound pick-up device, an amplifier and a recording device, a plurality of filters having transmission characteristics suited to the respective selections and switching means for selectively connecting any one of said filters into said recording circuit whereby the system may be readily adjusted in accordance with the tone qualities to be transmitted and means associated with said switching means to prevent more than one of said filters from being connected into the recording circuit at the same time.

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