June 13, 1950 J. P. SMITH, JR 2,511,085

CUING CONTROL FOR AUDIO CIRCUITS

Filed Nov. 15, 1946 2 Sheets-Sheet 1

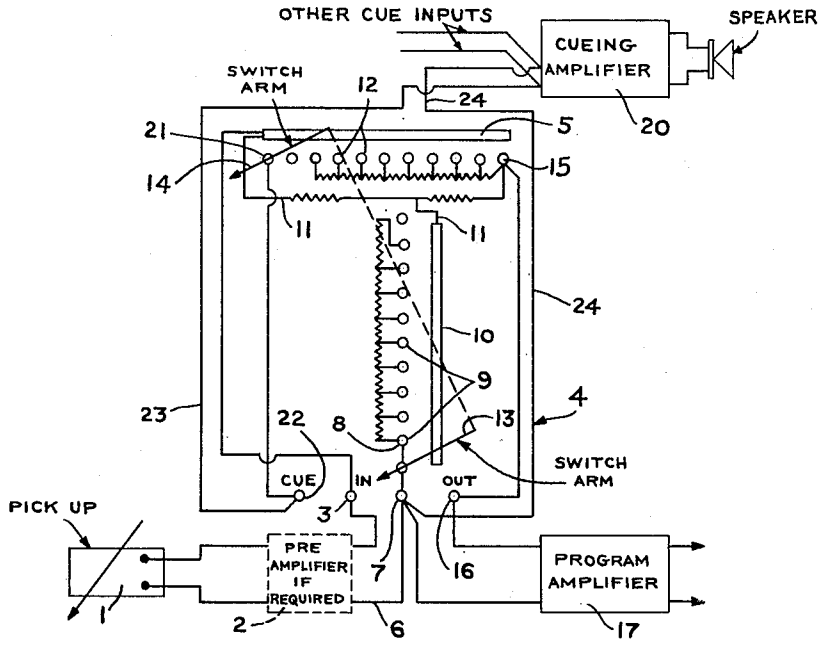


FIG. 1

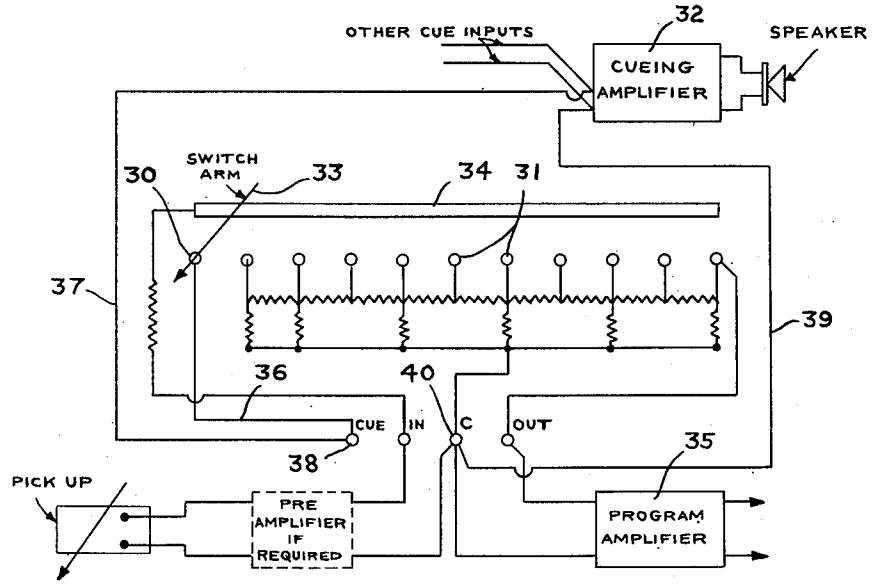


FIG. 2

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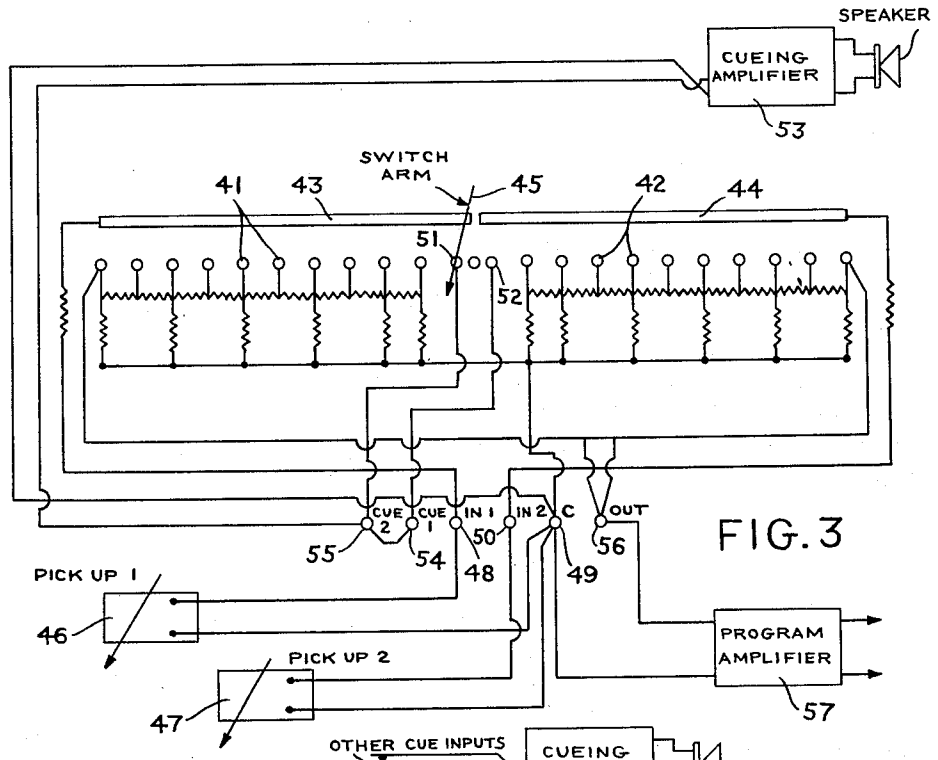


FIG. 3

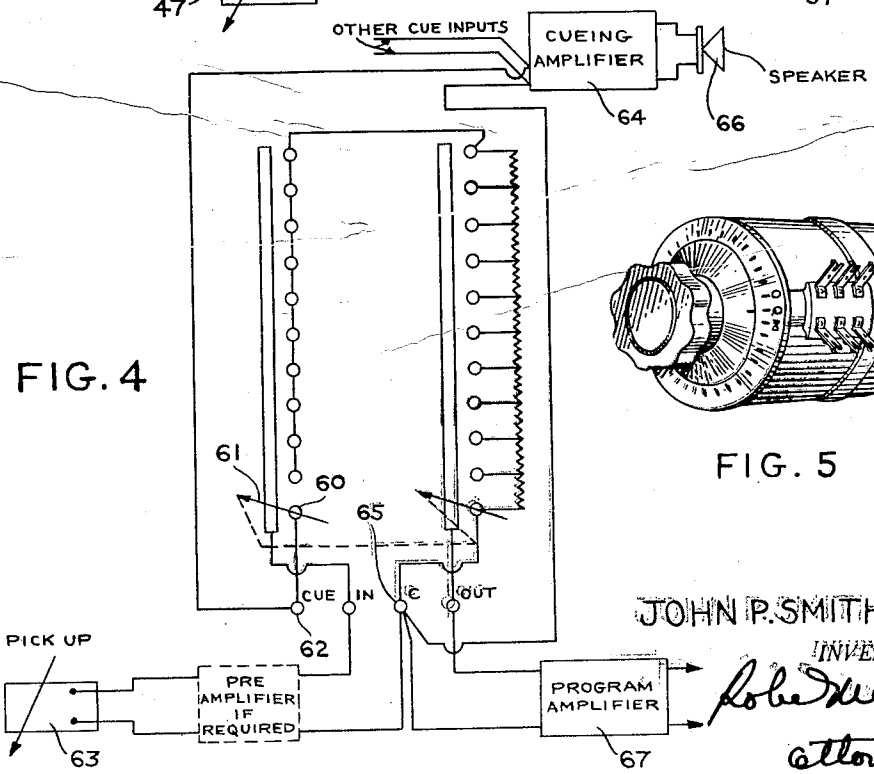


FIG. 4

FIG. 5

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CUING CONTROL FOR AUDIO CIRCUITS

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2 Claims. (Cl. 179—1)

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This invention relates broadly to audio circuits or systems and more particularly to a direct cuing control whereby the program material passing over the circuit may be transferred to a separate cuing amplifier.

Heretofore it has been the practice to use an auxiliary key switch to monitor a program, which key switch was operated to cut in the volume control and subsequently operated to fade in the program.

An object of the present invention is to provide a cuing control, applicable for use in broadcasting stations, recording studios for playing back recorded programs, wired music services, sound motion film industry, for dubbing and re-recording for sound effects, etc., wherein provision is made at the extreme attenuation position of an attenuator for connecting the incoming signal to a cue circuit before "fading in" the signal, whereby a program can be smoothly "brought in" at the right time without operation of any additional switches, and which eliminates auxiliary switching mechanisms in cue recording, transcriptions and remote or network programs.

A further object of the invention is to provide a cuing control which will eliminate the "clicks" and other extraneous sounds occasioned by the operation of the key switches now employed to monitor a program.

Throughout the present specification the term "cuing" is used in the manner and with the meaning employed in the audio broadcasting industry; i. e., means for signalling either visibly or audibly to the engineer, announcer, operator in the case of broadcasting reproduced programs from discs, actors or others that a change or further action is required. That is, to give a "cue" such as a prompter provides in opera renditions or other stage plays. The cuing amplifier is used in connection with an amplifier and speaker which is located in the control room of a broadcasting system so as to enable the operator to cut in and hear the program at any time for the purpose of giving him a cue for alteration in the program, such as when disc recordings are being employed, giving him a cue as to when to start a subsequent disc without causing a break in the program or for giving him a cue as for various other breaks or insertions into the program being broadcast.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a cuing control for audio circuits of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

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In the drawings:

Figure 1 is a diagrammatic view showing the improved cuing control associated with an attenuator of the "T" type.

Figure 2 is a diagrammatic view showing the cuing control incorporated in a typical ladder type attenuator.

Figure 3 is a diagrammatic view showing the cuing control incorporated in a typical ladder fader attenuator or control.

Figure 4 is a diagrammatic view showing the cuing control incorporated in a typical potentiometer control.

Figure 5 is a perspective view of one form of an attenuator embodying the cuing control.

Referring to the drawings and more particularly to the form of the invention shown in Figure 1 of the drawings, the improved cuing control is shown embodied in an audio wave transmitting circuit which includes an adjustable transducer for reducing the amplitude of the audio waves of the type known in the trade as a "T" control or attenuator.

The audio wave transmitting circuit includes the pickup 1, or source of the sounds to be transmitted, which pick-up is connected to a pre-amplifier, as indicated at 2, if pre-amplifier is necessary. From the pre-amplifier 2, or if pre-amplification is not necessary, direct, one of the wires of the circuit is connected as shown at 3, through the "in" connection of the "T" attenuator structure 4 with the slip rings or output contact 5 of the attenuator, while the other wire 6 is connected through the "c" or common connection of the attenuator with the first contact 8 of the series or set of input contacts 9, which co-operates with the slip rings 10. The slip rings 10 are connected by suitable wiring 11 with the slip rings 5, while the contacts 9 are selectively connected with the contacts 12 of the second set or series of contacts through the switch arms 13 and 14 which serve to connect the contacts 9 and slip rings 10, and contacts 12 and slip rings 5 respectively. The slip rings 5 and 10 are suitably connected to the first contact (indicated at 15) of the set or series of contacts 12 and this contact is connected to the "out" connection 16 of the attenuator. The out connection 16 is connected to the program amplifier 17 as is also the connection "c" of the attenuator, and thus the program amplifier is connected in the audio wave

transmitting circuit through the "T" attenuator. This is the usual approved structure as at present employed.

The present invention comprehends the connection in the circuit of an auxiliary or cuing amplifier, as indicated at 20 and which is controlled by the attenuator 4 whereby the program material passing through the circuit may be transferred to the auxiliary or cuing amplifier 20, and the program amplifier 17 be cut out of the circuit, or vice versa without the employment of an auxiliary key switch, its inconvenience of operation and the undesirable clicks and extraneous noises introduced by switches in the circuit.

An auxiliary or cuing control contact 21 is located at the extreme attenuation position of the set or series of contacts 12 and it is connected to the "cue" connection 22 of the attenuator structure 4. The cue connection 22 is also connected to the wire 23 which leads into the cuing amplifier 20, while the other wire 24 of the auxiliary or cuing amplifier 20 leads to and is connected to the "c" or common connection 7 of the attenuator structure. The switch arm 14 is moved beyond the last of the contacts 12, or beyond the extreme attenuation position into engagement with the auxiliary or cuing control contact 21 to cut the auxiliary or cuing amplifier 20 into the circuit and also cut the program amplifier out of the circuit. Thus the sequence of operation is, first step, in extreme position connects the cuing amplifier into the circuit, the next step (by movement of the switch arm 21) is cue off, program off, and the next step starts the "fade in" of the program through the program amplifier 17.

The invention may be embodied in many types of adjustable transducers for reducing the amplitude of waves of an audio circuit, and Figures 2 to 4 of the drawings show the invention embodied in some of such devices.

For instance, Figure 2 of the drawings shows the cuing control of the present invention embodied in what is known in the art as a ladder control.

In the ladder type adjustable transducer for reducing wave amplitude as the T type shown in Figure 1 of the drawings a cuing or auxiliary contact 30 is located just beyond the extreme attenuation position of the row of input contacts 31 and the closing of an auxiliary or cuing circuit through the cuing amplifier 32 is controlled by the switch arm 33. The switch arm 33 also serves to connect any one of the contacts 31 and the slip ring or output contact 34 in the audio circuit.

When the switch arm 33 is moved beyond the extreme attenuation position of the set or series of contacts 31 and into engagement with the auxiliary or cuing contact 30 the circuit through the program amplifier 35 is cut off and the circuit is closed through the cuing amplifier 32 through the wires 36 and 37 which connects to the auxiliary or cuing outlet 38 and wire or connection 39 which connects to the "c" connection 40 of the "ladder" type attenuator.

Figure 3 of the drawings shows the improved cuing control embodied in what is known in the art as a "ladder fader" control such as is usually employed in an audio circuit in which records are played for transmission over the circuit and in which dual turn tables are employed, the ladder fader transducer or attenuator serving to fade the program rapidly from one record to another.

In a ladder fader transducer or attenuator of this type there are two sets or series of contacts 41 and 42, which are connected to degrees of resistance as clearly shown in the drawings and with each of which slip rings 43 and 44 respectively, co-operate. A single switch arm 45 serves to establish connection between any one of the contacts of either set or series of contacts with the respective slip rings.

Two pick-ups 46 and 47 are provided (i. e. two turn table mechanisms for playing records).

The pick-up 46 is connected through the "in" connection 48 to the first of the contacts of the set 41 and through the "c" connection 49 in the attenuator. The pick-up 47 is connected through the "in" connection 50 to the first of the contacts in the series or set 42 and the "c" connection 49 to the attenuator. An auxiliary or "cue" contact 51 is positioned just beyond the extreme attenuation position of the contacts 41 and a second auxiliary or "cue" contact 52 is positioned just beyond the extreme extenuation position of the contacts 42. These contacts 41 and 52 are connected in circuit with the auxiliary or cuing amplifier 53 by means of the switch arm 45, the "cue" connections 54 and 55, suitable wiring and the "c" connection 49 to permit transmission of the program from either the pick-up 46 or the pick-up 47 to and through the cuing amplifier 53, and at the same time cut out the transmission of the program to the program amplifier 57.

Figure 4 of the drawings shows the improved cuing control embodied in a potentiometer (potential divider) and in this application of the invention as in the other forms an auxiliary or cue contact 60 is placed just beyond the extreme attenuation position of the potentiometer, and is engaged by the switch arm 61 to close the circuit through the "cue" connection 62 and transmit the program from the pick-up 63 to the auxiliary or cuing amplifier 64, the circuit being completed through the "c" connection 65 on the potentiometer. When the program is passing through the cuing amplifier and consequently through the speaker 66 connected thereto the program amplifier 67 is cut out of the circuit.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. An adjustable transducer for use in an audio signal transmitting system including a program amplifier, an auxiliary amplifier, a wave amplitude controlling circuit connected to said program amplifier, and an auxiliary circuit connected to said auxiliary amplifier, said adjustable transducer including a plurality of spaced contacts arranged in a set, wave impedance means, said spaced contacts connected to spaced points on said wave impedance means and therethrough to one line of the circuit, a common contact connected to the line of said circuit to said program amplifier and said auxiliary amplifier, a manually movable switch arm for circuit closing engagement with said common contact and any one of said spaced contacts to close a circuit through said program amplifier, an auxiliary contact located at the extreme attenuation position of said set of spaced contacts and connected in the circuit to said auxiliary amplifier, and means for mounting said switch arm whereby the switch arm may be manually moved into contact engagement with said auxiliary contact and

said common contact to close a circuit through said auxiliary amplifier and break a circuit through said program amplifier.

2. In an adjustable transducer for reducing the amplitude of a wave of an audio circuit including a plurality of spaced contacts arranged in a set, wave impedance means, said spaced contacts connected at spaced points to said impedance means and through the impedance means to the circuit, a common contact, means connected to said common contact for connecting it in a circuit, an auxiliary contact spaced at the extreme attenuation position of said spaced contacts, means for connecting said auxiliary contact in a circuit independently of said spaced contacts, a switch arm, and means for mounting said switch arm whereby the switch arm may

be moved to engage said common contact and any one of said spaced contacts or to engage said common contact and said auxiliary contact.

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