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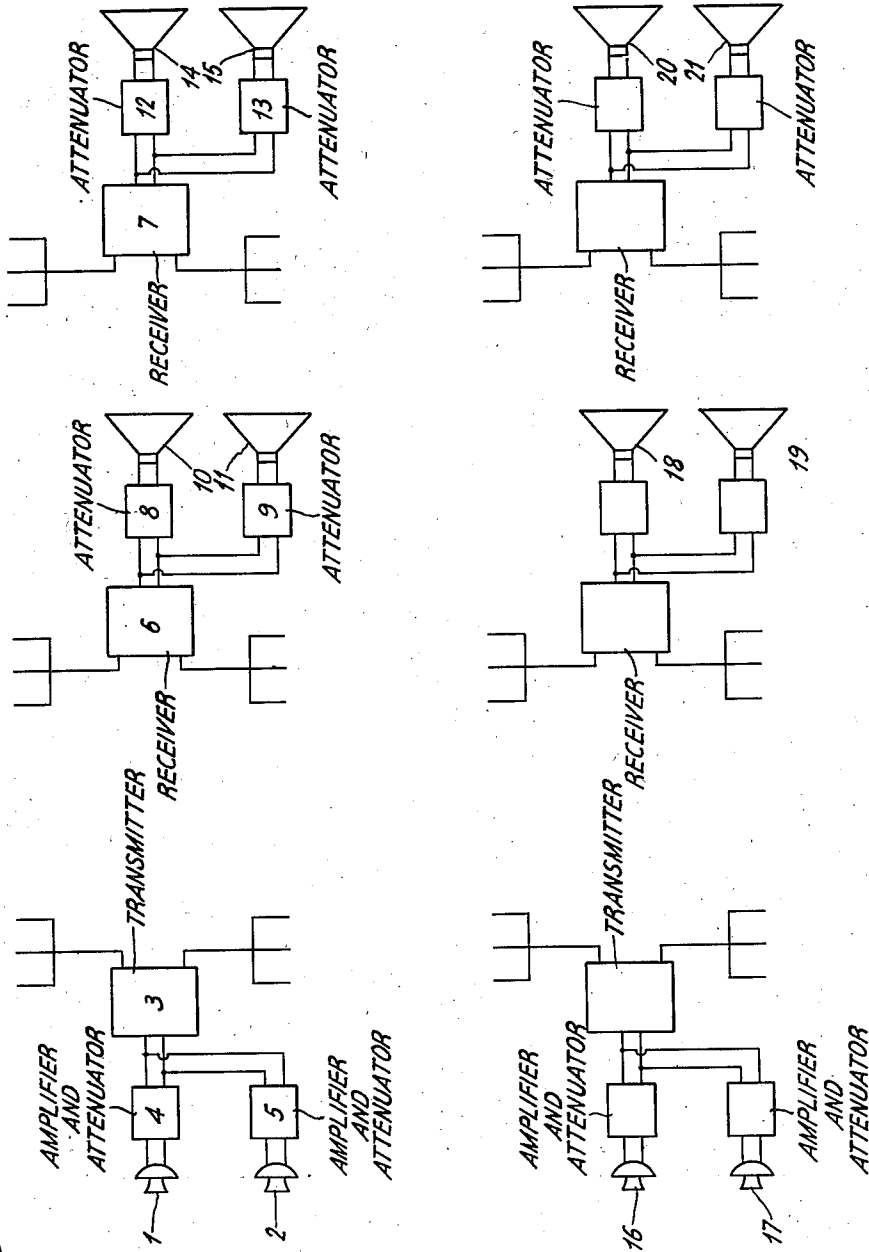
2,081,625

PUBLIC ADDRESS SYSTEM AND THE LIKE

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2 Sheets-Sheet 1

Fig. 1



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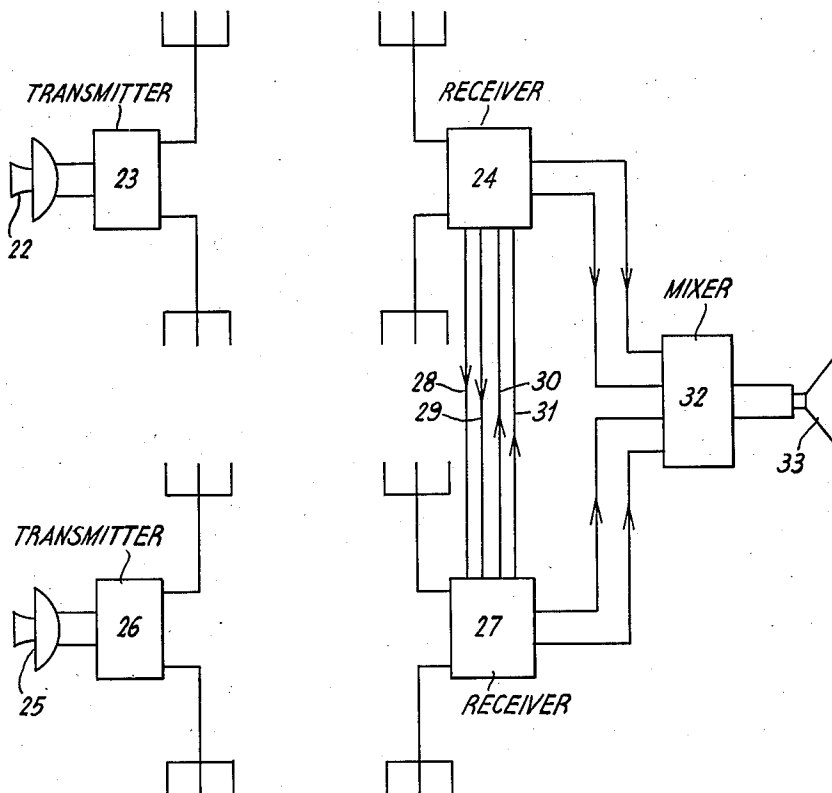
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Fig. 2



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PUBLIC ADDRESS SYSTEM AND THE LIKE

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3 Claims. (Cl. 250—6)

This invention relates to ultra-short wave radio transmitting and receiving apparatus suitable for use in public address systems and the like, and has for its principal object the provision of an improved apparatus and method of operation whereby sound controlled as to volume or tone or both volume and tone is readily transmitted by means of an ultra-short wave carrier over relatively short distances either to produce the effect of auditory perspective or to select between the sounds picked by microphones spaced from one another.

The invention will be better understood from the following description when considered in connection with the accompanying drawings and its scope will be pointed out in the appended claims.

Referring to the drawings,

Fig. 1 illustrates a dual channel transmitting and receiving apparatus operable to reproduce sound which appears to move in accordance with the movement of the point at which the sound originates, and

Fig. 2 illustrates a somewhat similar apparatus which is operable to select between the sounds picked up by a plurality of microphones so that, at any given time, the sound at only one of the microphones may predominate in the sound reproduced.

The several operations involved in carrying out the invention may be performed by instrumentalities well known to those skilled in the art and such instrumentalities are therefore disclosed conventionally in order to avoid unnecessary difficulty in understanding their new relation and ultimate effect. Thus the tone and volume control features of the various amplifiers comprised in the apparatus may assume any one of a number of well known forms and need not be described in detail. Likewise the cross sensitizing circuit between the receivers of Fig. 2 is an instrumentality well known in a variety of forms. Insofar as applicant is aware, however, the disclosed functional relationship between the various instrumentalities is new and makes available for the first time a public address or like system wherein sound picked up at a plurality of points is transmitted over ultra-short wave channels either to produce an auditory perspective effect or to produce sound which is selective with respect to sound waves picked up by one microphone or another depending on the point of sound origin. Auxiliary features of the invention are the control of the tone of the reproduced sound either at the transmitter or re-

ceiver, and manual or automatic volume control of the reproduced sound either at the transmitter or receiver.

Important advantages of the invention are the absence of wiring between the sound pick-up and reproducer, greater flexibility in the arrangement of the various parts of the apparatus, variation of the tonal quality of the reproduced sound either at the transmitter or receiver to minimize reverberation due to the acoustics of the auditorium, and selectivity between the outputs of different microphones to prevent dead spots resulting from sound waves out of phase with one another.

The system of Fig. 1 includes microphones 1 and 2 from which current is supplied to a transmitter 3 respectively, through an amplifier and attenuator 4, and an amplifier and attenuator 5. As previously indicated, the transmitter 3 is preferably of the ultra-short wave type and the amplifier and attenuator units 4 and 5 are provided with tone control and either manual or automatic volume control features.

The sound modulated ultra-short wave originating at transmitter 3 is received at receivers 6 and 7. The signal received at the receiver 6 is transmitted through attenuators 8 and 9, respectively, to loud speakers 10 and 11. The wave received by receiver 7 is likewise transmitted through attenuators 12 and 13, respectively, to loud speakers 14 and 15.

At a point spaced from the location of the microphones 1 and 2 are located the microphones 16 and 17 from which sound is transmitted to loud speakers 18 to 21 through a channel similar to that of the channel connected to microphones 1 and 2 except that the ultra-short wave carrier is of a different frequency from that of the first channel.

In the use of the apparatus as a public address system, the microphone transmitter units 1—2 and 16—17 may be located on the speakers' platform and the receiver loud speaker units may be located at different points within the auditorium. While only two channels are shown, it will be apparent that any number of channels may be utilized and that the various channels may be so arranged that change in the location of sound origin will result in predominance of the sound reproduced by one or another of the receiver loud speaker units. Since both the microphone transmitter units and receiver loud speaker units are provided with tone and volume control features, the reproduced sound may evidently be controlled at all times either at the transmitter or receiver

to conform to the acoustic characteristics of the auditorium in which the apparatus is located. The transmitter and receiver units may be operated from direct or alternating current circuits or from batteries.

The apparatus of Fig. 2 is similar to that of Fig. 1 in that sound picked up by a microphone 22 is delivered to an ultra-short wave transmitter 23 and is received at a receiver 24. Likewise sound picked up at a microphone 25 is transmitted to an ultra-short wave transmitter 26 operating at a different carrier frequency from that of transmitter 23 and is received at a receiver 27. The receivers 24 and 27 are cross-sensitized as indicated by connections 28 to 31 so that the current of either of the receivers controls the sensitivity of the other receiver in an inverse sense. Thus, if receiver 24 picks up a loud signal and receiver 27 a weak signal current carried over the wires 28 and 29, for example, will reduce the sensitiveness of the receiver 27 and vice versa. Likewise, a strong signal received by receiver 27 will reduce the sensitivity of receiver 24 by current transmitted over wires 30 and 31. Various types of cross-sensitized receivers operable to produce the above results are well known to those skilled in the art and need not be described in detail. The outputs of receivers 24 and 27 are supplied through a mixer 32 to a loud speaker 33. It will be understood that the number of receivers cross-sensitized as described above is not limited to two but may be increased as required.

This type of public address or like system has many advantages. Assuming speeches to be picked up at a long table with a chairman at the center of the table and a speaker at one end, the microphone 22 may be located near the chairman and the microphone 25 near the speaker. Motion of a speaker to and fro can be similarly handled

by placing several microphones along the speaker's path. This is particularly useful in connection with restless speakers in the case of debates and in stage representations where the actors are mobile. Also with this arrangement the various phases of a procession can be picked up without interference due to the fact that a sound wave is received at different microphones in an out-of-phase relation.

Having thus described my invention, I claim:

1. A public address system comprising a plurality of spaced microphones, a plurality of ultra-short wave radio transmitters connected to said microphones and operable over different frequency ranges, a plurality of radio receivers tuned to the individual transmitters and means inter-connecting said receivers to suppress sound transmitted from the microphone most remote from the origin of the transmitted sound by controlling the corresponding receiver.

2. A public address system comprising a plurality of spaced microphones, a plurality of ultra-short wave radio transmitters connected to said microphones, and operable over different frequency bands, a plurality of radio receivers, each tuned to one of said transmitters, and automatic volume control means on one of said receivers operable to control the volume of the other of said receivers.

3. A public address system comprising a plurality of spaced microphones, a plurality of radio transmitters operable over different frequency bands and connected to said microphones, a plurality of radio receivers, each tuned to the operating frequency of a different one of said transmitters, and automatic volume control means on each of said receivers operable to control the volume of another of said receivers.

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