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AMPLIFYING AND REPRODUCING SYSTEM

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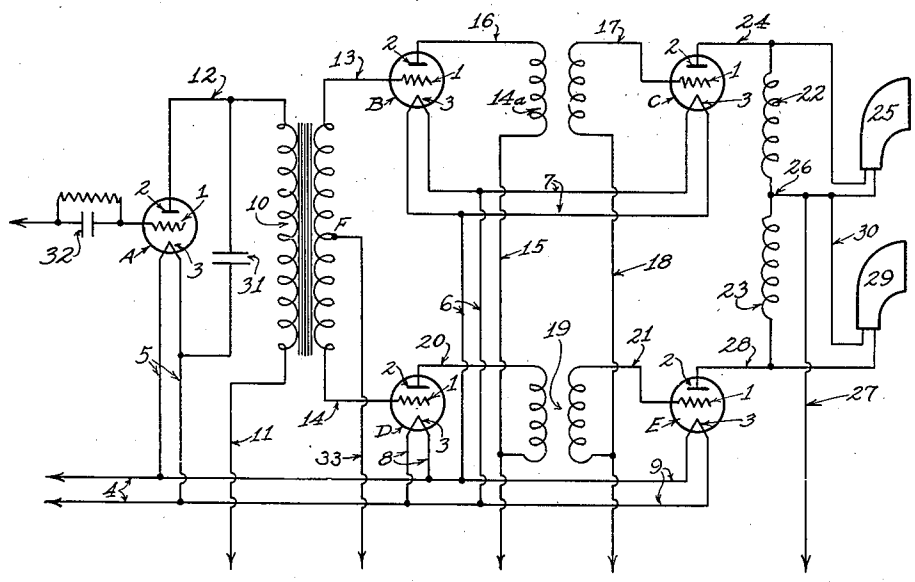

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AMPLIFYING AND REPRODUCING SYSTEM

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This invention relates in general to amplifying systems, and more particularly to audio amplifying systems adapted to operate a plurality of loud speakers from a common source.

An object of my invention is to provide an amplifying system having embodied therein means for producing clearer, more distinct and comparatively stronger tones than are produced with radio apparatus now commonly used.

A further object of my invention is to provide an audio amplifying system having in combination with two or more sets of audio circuits, tubes and transformers, a plurality of loud speakers which are adapted to be controlled independently of each other but are operated from a common source.

The accompanying drawing illustrates the circuits and arrangement of one embodiment of my invention, but it is to be expressly understood that the drawing is for purposes of illustration only and is not to be construed as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

Referring to the drawings the letter A represents a detector tube; B and C, a first audio tube and a second audio tube, respectively; and D and E also a first audio tube and a second audio tube respectively. Each of the said tubes is of the kind now commonly used in radio receiving sets, and each comprises a grid 1, a plate 2 and a filament 3.

Electrical power from a suitable source such as a set of A batteries, is carried through wires 4, and the said wires are connected by means of conductors 5, 6, 7, 8 and 9 to the filaments 3 of tubes A, B, C, D and E respectively.

A transformer 10 having an intermediate tap as at F has one terminal of its primary winding connected by wire 11 to a source of B voltage, and the other terminal of its primary connected by a wire 12 to the plate 2 of tube A. Its secondary winding is connected by wire 13 to the grid 1 of tube B and by wire 14 to the grid 1 of tube D, while the tap F is connected by wire 33 to the filament circuit, preferably through a suitable negative bias such as a C battery. A transformer 14ª has its primary winding connected by a wire 15 to a source of B voltage and to the plate 2 of tube B by a wire 16, and its secondary winding connected to the grid 1 of tube C by a wire 17 and to the negative terminal of a C battery by a wire 18. A second transformer 19 is similarly connected to the wires 15 and 18, to the plate 2 of the D tube by a wire 20, and to the grid 1 of tube E by a wire 21. Two audio frequency choke coils or output impedances 22 and 23 are connected together to wire 26, 22 being connected by a wire 24 to the plate 2 of tube C, which wire 24 also connects the said choke coil to a loud speaker 25. The loud speaker 25 is connected by the wire 26 to the choke coils 22 and 23, and a wire 27 connects wire 26 with a source of B voltage.

The lower terminal of choke coil 23 is connected to the plate 2 of tube E by a wire 28, and the said wire also is connected to a second loud speaker 29. The loud speaker 29 is also connected to the choke coils 22 and 23 by a wire 30 which joins wire 26.

A condenser 31 is connected to wire 12 and one of the wires 5, while the grid 1 of tube A is connected to a grid condenser 32 shunted by a grid leak.

The arrangement of the various tubes, transformers and their connecting wires, the electrical energy being supplied from a single set of batteries for the operation of the two loud speakers, makes possible the production of tones which are much clearer than those produced with apparatus in which one loud speaker is used. The audio tubes D and E, together with the choke coils 22 and 23 and the transformer 19, afford suitable means for supplying the requisite amount of electrical current from a single set of batteries for the satisfactory operation of a second loud speaker 29. The electrical energy required for the operation of the two loud speakers 25 and 29 is slightly more than would be necessary for the operation of a single loud speaker, but with the two loud speakers a much greater volume can be satisfactorily produced without the distortion usually accompanying the production of intensified

tones by a single loud speaker. The volume and quality of tone produced by each of the loud speakers 25 and 29 is approximately the same as that obtained ordinarily with one loud speaker, and it is not necessary to energize the loud speakers beyond their ordinary capacity in order to increase the volume.

By constructing the transformers 10, 14ª and 19 and/or the choke coils 22 and 23 with windings of different characteristics, the two circuits supplying current for the operation of the loud speakers 25 and 29 may be made to conduct different quality vibrations, thereby permitting one of the loud speakers to produce low frequency tones and the other high frequency tones. This feature enables the production by the combined loud speakers of tones by the two loud speakers which are full, clear and quite similar to the original tones. As the invention is essentially an audio amplifier and reproducer, it will be understood that its use is not limited to the amplification and reproduction of audio signals detected from a radio or other carrier wave, but it may be used for operating upon current from any source which has its output connected to the transformer 10.

With the apparatus comprising my invention a pleasing effect may be produced by separating the two loud speakers. The tones produced by the two loud speakers can then be made to reach the ear at slightly different times or slightly out of phase, the result being that clear, distinct and intensified tones are received by the listener without distortion or unpleasant effects.

It is therefore evident that the provision of an added circuit and the necessary parts for supplying oscillations from a single source to a plurality of loud speakers, makes possible the production of unusual effects with but a single power supplying unit. It is evident that various changes may be made in the construction and arrangement of parts without departing from the spirit of the invention, and in this connection it is desired that the appended claims define the limits of my invention.

Having described my invention, what I claim is:

1. Apparatus of the class described comprising a source of audio frequency energy including a transformer winding, parallel amplifying circuits connected to opposite ends of said winding, said amplifying circuits having dissimilar characteristics, an output winding having its opposite ends connected to said circuits, intermediate connections to said windings for supplying power to said circuits, and a pair of loud speakers each receiving the output of one of said circuits.

2. Apparatus of the class described comprising a source of audio frequency energy including a transformer winding, parallel amplifying circuits connected to opposite ends of said winding, said amplifying circuits having dissimilar characteristics, an output winding having its opposite ends connected to said circuits, intermediate connections to said windings for supplying power to said circuits, and a pair of loud speakers each connected across a portion of said output winding between one end thereof and its intermediate connection.

3. Apparatus of the class described comprising a source of audio frequency energy including a transformer winding having an intermediate connection, parallel amplifying circuits connected to opposite ends of said winding, said amplifying circuits having dissimilar characteristics, a pair of output impedances having a connection common to one end of each and each having its other end connected to one of said parallel circuits, a source of power connected between said intermediate connection and common connection, and a loud speaker connected across each of said impedances.

4. Apparatus of the class described comprising a source of audio frequency energy including a transformer winding having an intermediate connection, parallel amplifying circuits connected to opposite ends of said winding, a pair of output impedances having a connection common to one end of each and each having its other end connected to one of said parallel circuits, a source of power connected between said intermediate connections and common connection, a loud speaker connected across each of said impedances, said circuits and associated impedances having dissimilar characteristics whereby each of said loud speakers has maximum response at a different frequency.

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