

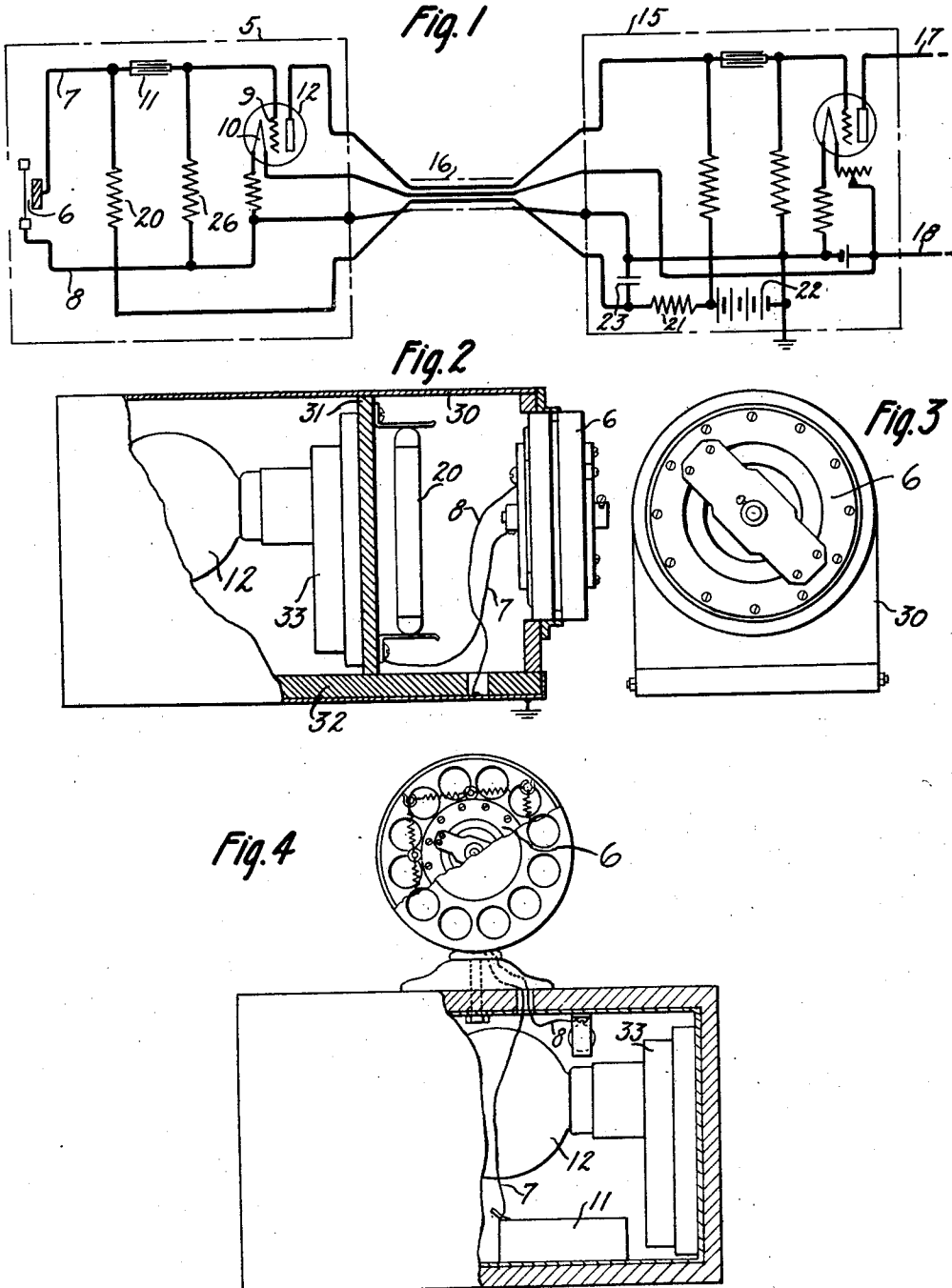
July 26, 1927.

1,636,765

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WAVE TRANSMISSION SYSTEM AND APPARATUS

Filed Aug. 20, 1925



Inventor:
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Patented July 26, 1927.

1,636,765

UNITED STATES PATENT OFFICE.

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WAVE-TRANSMISSION SYSTEM AND APPARATUS.

Application filed August 20, 1925. Serial No. 51,280.

This invention relates to sound wave energy transmission systems and has for its object an improved arrangement of high impedance apparatus to obtain the maximum transfer of energy with minimum interference from external sources.

The invention relates particularly to such recording, reproducing and public address systems as employ condenser type translating devices and thermionic amplifiers and contemplates the placing of at least the first stage of amplification as close as possible to the translating device and making the input leads to the amplifier as short as possible thereby minimizing their shunting capacity effect and their susceptibility to the inductive influences of external sources.

Heretofore, special low capacity cords several feet in length were used to connect the condenser transmitter to its associated amplifier. Considerable improvement in efficiency is realized by mounting the amplifier in a housing with the transmitter so that the connecting conductors may be made short and of negligible capacity. The condenser transmitter may be of any suitable type such as shown in Patents 1,333,744 of March 16, 1920, to E. C. Wentz and 1,456,538 of May 29, 1923, to I. B. Crandall. Since this type of transmitter has a very low capacity of the order of 400 micro-microfarads it will be seen that the electrostatic capacity between input leads of any appreciable length will produce a serious shunting effect on the transmitter and reduce its sensitivity. Moreover the longer the leads the greater the shunting effect and at the same time the more susceptible is the system to electrical disturbances.

Referring to the drawing,

Fig. 1 shows a transmission system and illustrates diagrammatically the grouping or arrangement of the apparatus according to the invention;

Fig. 2 is a sectional view of the combined transmitter and amplifier mounting embodying the invention;

Fig. 3 is a front view of the mounting shown in Fig. 2; and

Fig. 4 is another modification of the invention.

In the schematic of the system there is shown within the box or shield 5 a condenser transmitter 6 connected to the input of the amplifier 12 by leads 7 and 8 leading to

the grid 9 and the cathode 10, respectively. A condenser 11 in the lead 7 blocks the potential of the transmitter battery 22 from the grid. The battery 22 supplies the space current for the amplifier, and polarizing potential for the condenser transmitter 6 through a resistance 20 of the order of twenty megohms. The resistance 21, which may be of the order of one megohm, and condenser 23 of the order of one microfarad, form a filter to prevent fluctuation of battery 22 from affecting a transmitter. Since the impedance of the transmitter is very high, it is connected directly to the grid of the input through the blocking condenser 11. The grid leak resistance 26 may be of the order of 20 megohms. As indicated in the drawing, the transmitter 6 and its associated amplifier are grouped together within the shield 5 and connected to the other stages of amplification represented as being in the box 15, by means of a suitable cord or cable 16 which is preferably of the shielded type to prevent inductive interference from outside sources. Although only one stage of amplification is shown in box 15, it is obvious that any number of stages may be used in order to raise the energy to the desired energy level. The terminals 17 and 18 may be connected in any well known manner to translating devices such as recorders or loud speaking receivers. The apparatus shown in box 5 may be mounted in a housing as shown on Fig. 2 which consists of a metal case having an opening in the front thereof in which is supported the transmitter 6. Spaced a short distance from the front of the housing is a partition 31 secured to a base 32 of insulating material. The partition 31 carries on one side the vacuum tube 12 and its mounting 33 and on the other side resistances 20 and 26 in suitable mountings. The conductors 7 and 8 are short, separated leads, the lead 7 connecting one terminal of the transmitter to one terminal of the resistance 20 and the lead 8 connecting the other terminal of the transmitter to the case 30 which is metal and serves as a shield for protecting the apparatus from outside disturbances, and is usually grounded.

Fig. 4 shows another form of mounting which consists of a transmitter mounting disclosed in Design Patent 65,194 to G. R. Lum, dated July 15, 1924. This mounting

is supported on the cover of a case which contains the amplifier 12, its mounting 33, resistances 20 and 26, the condenser 11 and suitable terminals for connecting the apparatus to the cord 16. The box or case is preferably of wood lined with a metallic shielding. The transmitter mounting is secured to the top of the box by a bolt making electrical contact with both the transmitter mounting and the shielding within the box. Conductors 7 and 8 are led through an opening in the base of the transmitter mounting and an opening in the top of the amplifier case.

15 The combined transmitter and amplifier mounting herein described form a very compact and portable set which may be mounted on any convenient standard. It is connected to the other amplifiers and the sources

20 of energy by the cable or cord 16. The connections and arrangement of apparatus not

pertinent to the invention have been omitted as they may be made according to methods well known to those skilled in the art.

What is claimed is:

In apparatus for the transmission of sound wave energy, an amplifier, a cabinet therefor, said cabinet comprising a metallic shield surrounding said amplifier, a condenser transmitter, a metallic shield therefor, said shields being electrically connected and said transmitter being connected to the input of said amplifier by sensibly short leads, having a capacity between them negligibly small in comparison with that of the transmitter and included within said metal shielding.

In witness whereof, I hereunto subscribe my name this 15th day of August A. D., 1925.

ALFRED S. CURTIS.