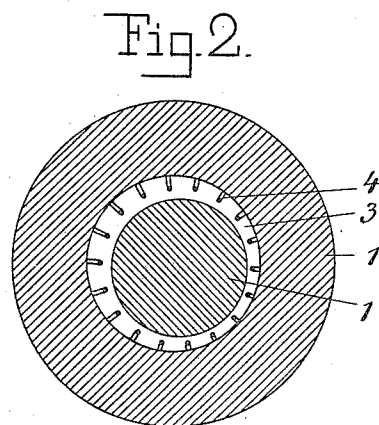
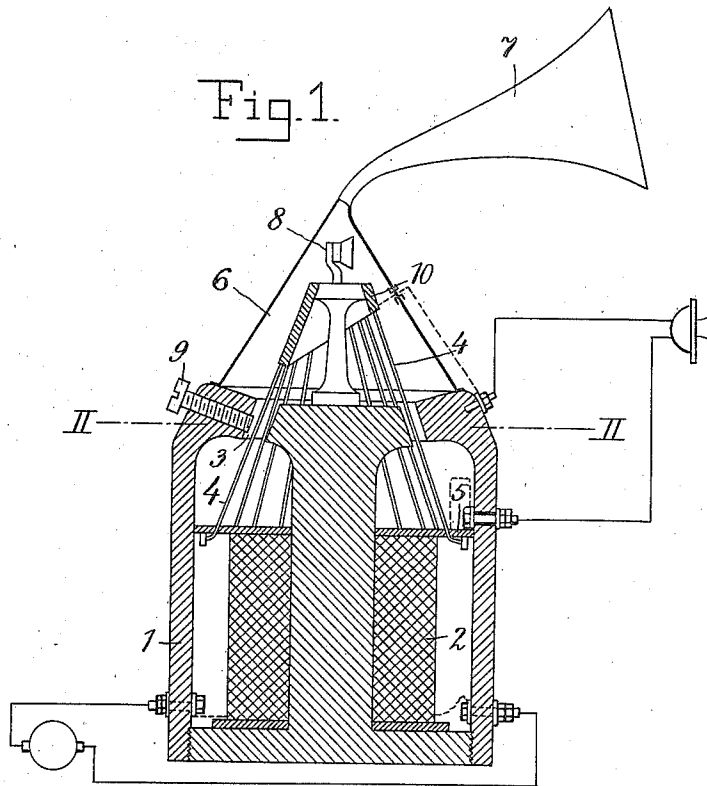


E. C. BAYER.
SOUND PRODUCING DEVICE.
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1,228,639.

Patented June 5, 1917



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ERIK CHRISTIAN BAYER, OF JORDLØSE, SVEBØLLE STATION, DENMARK.

SOUND-PRODUCING DEVICE.

1,228,639.

Specification of Letters Patent.

Patented June 5, 1917.

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To all whom it may concern:

Be it known that I, ERIK CHRISTIAN BAYER, a subject of the King of Denmark, residing at Jordløse, Svebølle Station, Denmark, have invented new and useful Improvements in Sound-Producing Devices, of which the following is a specification.

The present invention relates to a device adapted to transform electrical alternating currents, produced by a telephone-transmitter, into acoustic vibrations. This is attained by a series of tightened wires of non-magnetic material being inserted in the circuit of the telephone-transmitter, their individual rates of vibration being adjusted so as to agree with the various tones corresponding to the number of periods of the alternating current, and the wires crossing a powerful magnetic field, so that any alternating current, depending on its periodicity, will cause one of the wires to vibrate and thus produce the corresponding tone.

On the drawing, Figures 1 and 2 represent one manner of constructing the device, in vertical and horizontal section, respectively.

Referring to the drawing, 1 is the iron frame of a bell-shaped electromagnet with exciting coil 2 and an annular air slot 3. Through the latter a series of wires 4 is strung, their rate of vibration being adjusted for instance at intervals of half a tone from wire to wire so that, practically, all audible tones are represented. The wires are inserted in the circuit, in the telephone line, whose currents are to be transformed, and may be connected in series, in parallel or according to some combined system.

When now a powerful magnetic field is produced in the air slot by means of constant current through the coil 2, then each of the alternating currents, constituting the telephone-current, will cause the wire, corresponding to the periodicity of the current, to vibrate—and only this wire—whereby the wire produces the corresponding tone and, by the common action of all the wires, the entire telephone-current becomes converted into the corresponding tones, the voice, the song, the music, etc. By making the magnetic field 3 very strong, an extremely high intensification of the sound may be attained, and when, as represented in Fig. 1, a resonator 5, a sound-collector 6 and a funnel 7 are provided, the device may be used as a loudly speaking telephone.

The tones produced may also be caused to

act on a microphone 8, whereby the tones are transformed into alternating currents once more, the amplitude being increased, however. The device acts, in this case, as a telephone-relay and, in this respect, it possesses considerable advantages above the devices heretofore known. By the latter, the various tones are increased uniformly, but as the various tones are variously weakened in the cable lines, no intelligible conversation will be attained by intensifying a greatly weakened telephone current in an ordinary telephone relay.

By the above described device, however, it is practicable to intensify the various tones to various extents, according to a definite plan, and this may be effected by giving the magnetic field various strengths opposite the various wires. In Fig. 2 this is shown to be effected by giving the air-slot 3 a varying width at the various places. The magnets may also be fitted with adjustable pole-pieces by which means the width of the air-slot may be regulated. In order to concentrate the field around the wires suitable means, preferably iron screws 9 (Fig. 1) may be attached to the pole-piece.

By the means specified, it becomes practicable to intensify especially those tones which are mostly weakened in the cable lines, and, consequently, a device is attained differing from the heretofore known telephone-relays by not only intensifying the conversation but at the same time making it more intelligible.

In Fig. 1, the microphone 8 is shown to be placed on the common support 10 for the wires 4. The sound-waves, however, may also be transferred to the microphone by way of the air, some fluid, or in any other known manner.

When the wires are placed in the fields of several magnets, the intensity of the various tones may be adjusted by variation of the intensity of the exciting current for the various magnets.

Several of the devices specified may be inserted in one telephone-line, and they may either be concentrated at one single place or distributed, at suitable intervals, along the line.

Besides for the here mentioned use as a telephone relay, the apparatus is very suitable for the reproduction of sounds, such as speech, music, song, etc. When used for such purpose, the apparatus excels by its

ability to omit ("strain out") all impure secondary sounds, for instance when gramophone plates are used, the scratching of the pin on the plate and the foreign sounds produced by the diaphragm, so that the voice, the music, the song, etc., will appear with their original timbre and harmony.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a sound reproducing device, the combination with a telephone transmitter and its circuit, of a plurality of tightened wires of non-magnetic material adjusted to various tones and all constantly forming integral parts of said circuit, and a powerful magnet producing a field passed through by the said wires.

2. In a sound reproducing device, the combination with a telephone transmitter and its circuit, of a plurality of tightened wires of non-magnetic material arranged in a circle and adjusted to various tones and all constantly forming integral parts of said circuit, and a powerful magnet producing an annular field passed through by the said wires.

3. In a sound reproducing device, the combination with a telephone transmitter and its circuit, of a plurality of tightened wires of non-magnetic material arranged in a circle and adjusted to various tones and all

constantly forming integral parts of said circuit, and a powerful magnet producing an annular field passed through by the said wires and provided with means for adjusting its field intensity in respect of each individual wire.

4. In a sound reproducing device, the combination with a telephone transmitter and its circuit, of a plurality of tightened wires of non-magnetic material arranged in a circle and adjusted to various tones and all constantly forming integral parts of said circuit, and a powerful magnet producing an annular field passed through by the said wires and provided with means for adjusting its field intensity in respect of each individual wire, and a sound collector encircling said wires.

5. In a sound reproducing device responsive to undulating electric currents, the combination of a plurality of tightened wires of non-magnetic material adjusted to various tones and all constantly forming integral parts of a circuit which is adapted to convey said undulating electric currents, and a powerful magnet producing a field passed through by the said wires.

The foregoing specification signed at Copenhagen this 16th day of March, 1914.

ERIK CHRISTIAN BAYER.

In presence of—

CARL FOX MAULE,
JULIUS LEHMANN.