May 19, 1925. 1,538,319

L. GAUMONT

SOUND PRODUCING APPARATUS, OR ELECTROMAGNETIC RECEIVING OR EMITTING DEVICE

Filed June 12, 1923

Fig. 1

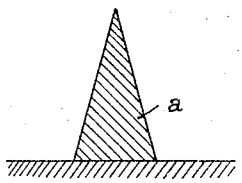


Fig. 2

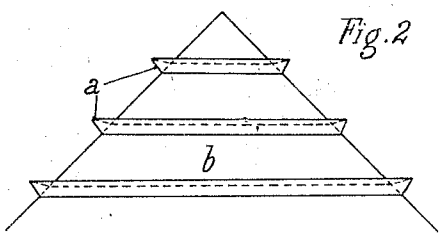


Fig. 3

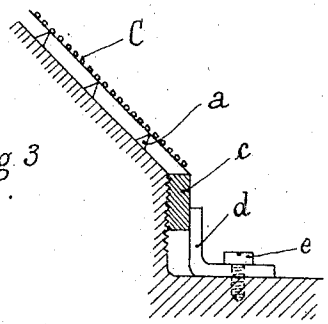
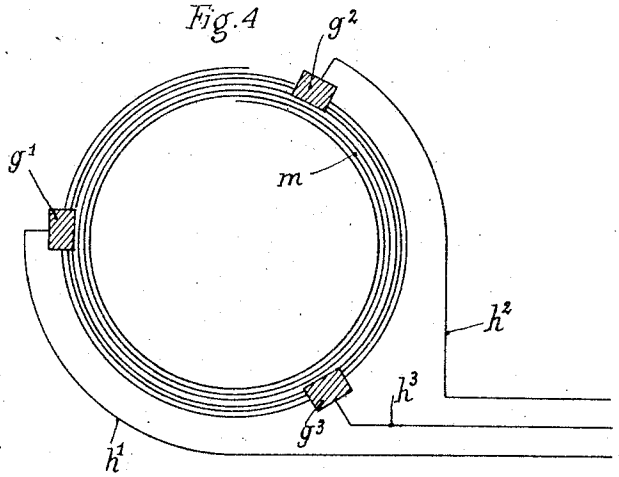


Fig. 4



INVENTOR

Leon Gaumont

BY Mauro, Cameron, Levin & Hackam

ATTORNEYS

Patented May 19, 1925. 1,538,319

UNITED STATES PATENT OFFICE.

LÉON GAUMONT, OF PARIS, FRANCE, ASSIGNOR TO SOCIÉTÉ DES ETABLISSEMENTS GAUMONT, OF PARIS, FRANCE.

SOUND-PRODUCING APPARATUS OR ELECTROMAGNETIC RECEIVING OR EMITTING DEVICE.

Application filed June 12, 1923. Serial No. 644,985.

To all whom it may concern:

Be it known that I, LÉON GAUMONT, a citizen of France, and a resident of Paris, France, have invented new and useful Improvements in Sound-Producing Apparatus or Electromagnetic Receiving or Emitting Devices, which is fully set forth in the following specification.

In the U. S. Patent No. 1,523,262, dated Jan. 13, 1925, there is described an apparatus for the production of sounds, constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current. The present invention relates to various improvements in the construction of the said wire winding, and it provides for the maximum acoustic efficiency as well as a correct tone.

The movements of the said wire winding under the action of the telephone current, which are on the order of 0.01 millimeter, are also to be produced without any appreciable damping, but nevertheless the wire winding must not assume any proper vibration under the action of forces having great amplitudes whereby a veritable phenomenon of resonance would take place.

According to the present invention, the said wire winding is mounted upon wedge-shaped bridges and is subjected to a well-determined tension.

The following description, together with the appended drawings which are given by way of example, sets forth the improvements according to the present invention.

Fig. 1 is a cross-section of a wedge-shaped piece or bridge.

Fig. 2 shews the bridges disposed upon the cone.

Fig. 3 is an axial section of the cone and the wire winding.

Fig. 4 is a diagrammatic view shewing the connections between the line wires and the diaphragm conductors.

The wire winding is mounted upon the wedge-shaped bridges *a* which are constituted by rings of an elastic substance of triangular cross-section and having a rather acute angle at the top, as observed in Fig. 1. The said rings are coaxial with the cone *b* and have a uniform spacing, so as to support the said wire winding after the manner of a violin bridge, Figs. 2 and 3.

The wire winding rests upon the point of the triangle and encounters practically no resistance in the case of very small vibrations, but the resistance will on the contrary increase at a rapid rate with the amplitude of the vibrations.

The said bridges may have different heights from the top to the base of the cone; the spacing will vary with the total surface of the diaphragm.

The said wire winding is mounted at its lower edge upon a metal ring *c* screwed upon the magnetic pole which is apertured at the base of the cone *b;* the ring will thus provide for an adjustment of the wire winding upon the elastic bridges which is performed in an exact and sensitive manner.

The said ring *c* may be readily secured in position after making the adjustment, by the use of a metallic stop-piece *d* which is pressed upon it by the screw *e* or by like means, Fig. 3.

The connection of the wire constituting the wire winding C with the wires of the circuit proceeding to the terminals is the weak point in the vibrating wire winding device; wires of very small diameter in aluminium or magnesium have but little mechanical strength and are easily broken under the action of vibrations of great amplitude made by a wire winding which receives an amplified current.

This drawback can be obviated by making the electric connections with the wire winding in the following manner.

The first three or four spiral turns of wire *m* are stripped of insulation and are connected together at three or more points by the binding elements g^1, g^2, g^3 of copper wire, each point being connected by a flexible conductor h^1 h^2 h^3 with the telephone circuit, Fig. 4. This arrangement forms a heavy turn in short-circuit which is not subject to vibrations.

Obviously, the said device is susceptible of modifications in detail without departing from the principle of the invention.

What I claim is:

1. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current, rings of elastic material disposed upon the lower pole-piece of the magnet for supporting the wire winding.

2. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current, rings of elastic material and of triangular cross-section with an acute angle at the ajex, disposed upon the lower pole-piece of the magnet for supporting the wire winding.

3. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current and rings disposed in concentric position and with uniform spacing upon the lower pole-piece of the magnet for supporting the wire winding.

4. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current and means provided upon the lower pole-piece of the magnet for supporting the wire winding.

5. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current, rings disposed upon the lower pole-piece of the magnet for supporting the wire winding, and means for stretching the wire winding upon the said rings.

6. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current, rings disposed upon the lower pole-piece of the magnet for supporting the wire winding, an internally screwthreaded ring secured to said wire winding, a corresponding screwthread formed upon a cylindrical portion of the pole-piece below the tapered portion.

7. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current, rings disposed upon the lower pole-piece of the magnet for supporting the wire winding, an internally screwthreaded ring secured to said diaphragm, a corresponding screwthread formed upon a cylindrical portion of the pole-piece below the tapered portion, means for securing the said ring in position.

8. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electromagnetic element producing or receiving the variable current, supporting means provided upon the lower pole-piece for supporting the wire winding, means for stretching the wire winding upon the said supporting means, means for supplying electric current to the wire of the diaphragm.

9. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electro-

magnetic element producing or receiving the variable current, the first turns of conducting wire of the wire winding are bared and short circuited, and the wires of the supply circuit are connected to the bared wires.

10. In an apparatus for the emission and reception of sound constituted by a magnet having an air gap, a wire winding on a support, said wire having therein a variable current produced by the acoustic displacements or being capable of producing such displacements, said winding representing at the same time a mechanical element receiving or emitting vibrations and an electro-magnetic element producing or receiving the variable current, supporting means provided upon the lower pole-piece for supporting the wire winding, means for stretching the wire winding upon the said supporting means, the first turns of conducting wire of the wire winding are bared and short-circuited, and the wires of the supply circuit are connected with the bared wires.

In testimony that I claim the foregoing as my invention I have signed my name hereto.

LÉON GAUMONT.