(No Model.)

J. A. BROWN.

MAGNETO TELEPHONE.

No. 511,118. Patented Dec. 19, 1893.

Fig. 1.

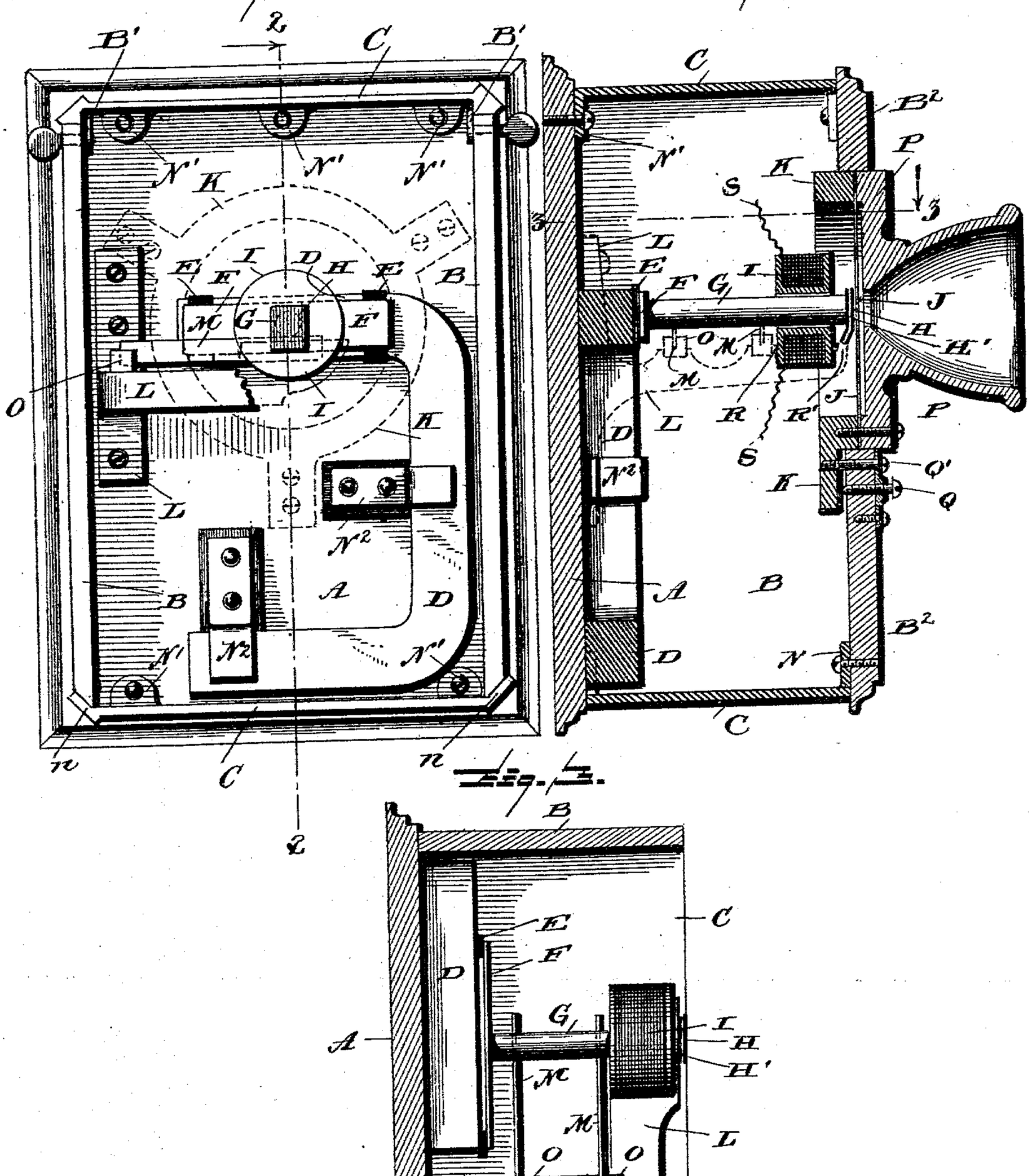

Fig. 2.

Fig. 3.

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MAGNETO-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 511,118, dated December 19, 1893.

Application filed August 16, 1893. Serial No. 483,290. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. BROWN, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Long-Distance-Telephone Transmitters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to long distance telephones, and aims to produce a current in a coil by induction from a permanent or electro magnet by varying the contact of the core of the said coil, which constitutes a temporary magnet with the aforesaid permanent magnet.

The improvement consists of the novel features and the peculiar construction and combination of the parts which will be hereinafter more fully described and claimed, and which are shown in the annexed drawings, in which—

Figure 1 is a front view of an instrument embodying the invention, the front of the case being removed. Fig. 2 is a vertical section on the line 2—2 of Fig. 1 looking to the left. Fig. 3 is a horizontal section on the line 3—3 of Fig. 2, showing the magnet and the core in full, the front part of the case being broken away.

The base A is preferably of wood to which are secured the metal end pieces C by means of lugs N′ cast on the said end pieces. The wooden sides B are secured at one end to one of the end pieces C by engaging with oblique flanges *n* at the ends of the said end piece C, and at the other end to the other end piece C by turn buttons B′ which are constructed to engage with the said end piece. The front B^2 is secured to the end pieces C by fastenings passing through lugs N in a manner similar to the base A.

The magnet D which may be permanent or electro magnetic is fastened to the base by clips N^2 and is preferably horse-shoe shaped. A bracket arm L is attached to the base A and projects forwardly to support a coil or solenoid I which is held between two projections R, R′ formed on the said bracket arm. Two light spring supports M secured at one end to lugs O on the bracket L project horizontally and sustain the core G of the solenoid or coil I. This core G is provided at its outer end with one or more armatures H and is adapted to engage at the inner end with an armature F of any inductive material, preferably soft steel, having a spring and insulated at the ends from the magnet by blocks E of insulating material, preferably mica. The diaphragm J is held between the parts K and P of the trumpet frame in the usual manner. This trumpet frame is adjustable relative to the casing to move the diaphragm to and from the armatures H to obtain the proper adjustment, set screws Q and Q′ being provided for the purpose. The terminals S of the coil or solenoid are suitably disposed to connect the instrument in circuit.

The coil or solenoid is without the field of the magnet and the core G is sufficiently long to project a short distance beyond the front end of the coil and extend to the said magnet and form in effect a pole thereof.

In operation it will be understood that the acoustic action imparted to the diaphragm by the sound waves, are imparted through the medium of the soft iron core G to the adjustable and movable armature F, which is normally adjusted to loosely contact at its center with the magnet D. Thus it will be seen that by varying the contact or pressure at this point in response to the vibration of the diaphragm, a series of changes is made in the magnetic state or potential of the soft iron core G, which will correspond exactly in number and intensity with the number and amplitude of the vibrations of the diaphragm. It will be understood by those skilled in the art, that the soft iron core G and the coil I of themselves are dead, and are excited by magnetic and electric energy, only when contact is made with the magnet D, and as the coil I is entirely out of the field of the magnet D, it is affected only by the magnetic impulses of the soft iron core G, the force of which depends upon the condition of the contact of the core G with the magnet D. Thus it will be

seen that the lines of force passing through the coil I, are set up by the core G, and their number and scope depend upon the condition of the contact of the pole with the magnet D, which is governed by the motion of the diaphragm. When the diaphragm is set in motion the forward movement causes the soft iron core G to move toward the magnet, which causes the armature F, which is insulated at each end from the magnet, to contact with the magnet, and the vibration of greatest amplitude causes a firm and perfect connection between the core G, armature F and magnet D, and in this condition almost the full force of the magnet D is carried to the end of the core G, where the coil is, thus practically extending the pole of the magnet D to end of core G passing through the coil I, and when the diaphragm starts on its return motion, the perfect contact of the pole of the core G with the magnet D is at once interrupted, and soon broken, and as the armature F between the core G and the magnet D is of spring material, and being adjusted to just loosely contact with the magnet while its inclination is to spring away, will cause a rebound at the limit of the return of the diaphragm, when it is ready again for the forward motion in response to the following vibration, and at this point it will be seen that the core G is practically dead, as its only resource is to obtain a force from the armature F which is only in the field of the magnet D, and not a part of it. Thus it will be seen that we have the variable scope of, from the full force of a powerful magnet down to nearly nothing, which represents the variable current set up in the coil I for overcoming the resistance of the line and operating the receiver, and when it is taken into consideration that a dynamic current or a current generated by a magnet is of a nature having greatest capacity for overcoming resistance, and that for telephonic purposes an undulating current of greatest range of variation is the one which operates the diaphragm with greatest amplitude, or causes the receiver to speak the loudest, the value of my instrument and the application of the art as described, will be apparent. The diaphragm J may impinge directly upon the end of the core G, but I attain a little louder transmission by inserting the two armatures between the core G and the diaphragm J as shown in the drawings. I have also transmitted articulate speech over a great resistance (twelve thousand four hundred and twenty-two ohms) by simply allowing the core G to rest against the side of the magnet D and disturbing the contact by friction. Thus it will be seen that the spirit of my invention is to produce a current in a coil in the field of a temporary magnet, by varying the contact of the temporary magnet with the magnet, (permanent or electro,) while the construction I show is of preferable form.

Having thus described my invention, what I claim to be new, and desire to secure by Letters Patent, is—

1. In the art of telephony, the herein described means for producing an undulating current consisting of a magnet a coil, an interposed spring-armature, and a core, unsupported at its ends and adapted to have a variable, frictional or pulsatory contact with the said magnet, substantially as set forth.

2. The herein described means for producing an undulatory current for the transmission of articulate speech or sound consisting of a magnet, a coil and a core, unsupported at its ends and adapted to make variable contact with the said magnet, and light spring supports for the core substantially as described.

3. The herein described means for producing an undulatory current for the transmission of articulate speech or sound, consisting of a magnet, a coil or solenoid without the field of the magnet, a spring armature interposed between the coil and the magnet, and a core unsupported at its ends and adapted to be influenced by the said magnet to produce an undulatory current in the said coil or solenoid, substantially as described.

4. In a telephone a magnet, a coil or solenoid, and a core mounted for free horizontal movement in the direction of its length and having a coil and armatures at one end and a spring armature at the other end, substantially as described, combined and operating substantially as set forth.

5. In a telephone, the combination with a magnet, and a coil or solenoid having its core adapted to make variable contact within the field of the magnet, of an armature in contact with the said core and insulated from the said magnet and adapted to pulsate, and a spring armature interposed between the core and the magnet, substantially as specified.

6. In a telephone, the combination with a magnet a coil or solenoid without the field of the magnet, a core having magnetic energy imparted thereto from the said magnet, an armature carried by the outer end of the core, an armature of inductive spring material at the inner end of the core insulated from the magnet, and spring supports for sustaining the core in proper relation without impeding its free pulsatory movement, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES A. BROWN.

Witnesses:
RINGER A. SILVERTHORN,
S. W. ODELL.