(No Model.)

F. H. BROWN.

MAGNETIC TELEPHONE.

No. 523,927. Patented July 31, 1894.

Fig. 1.

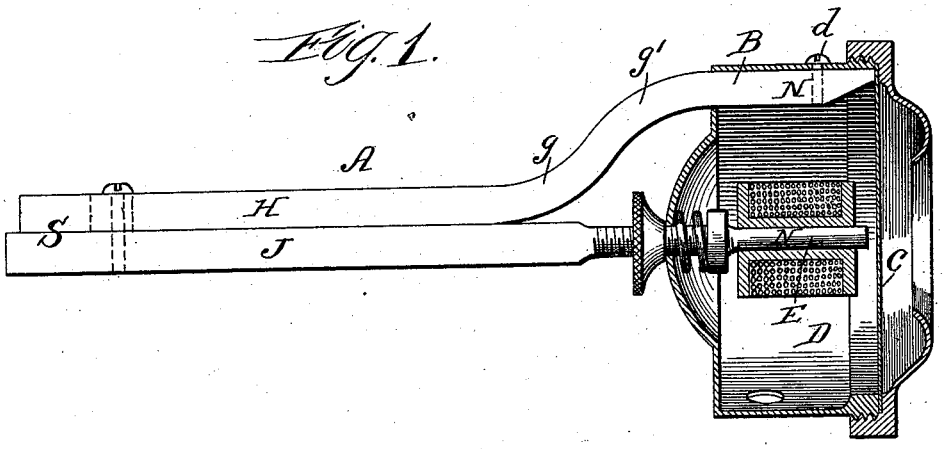


Fig. 2.

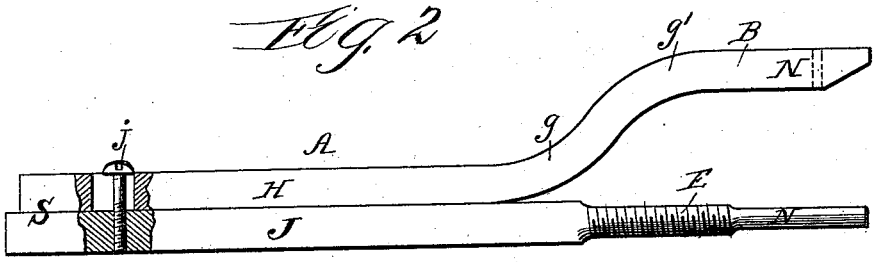


Fig. 3.

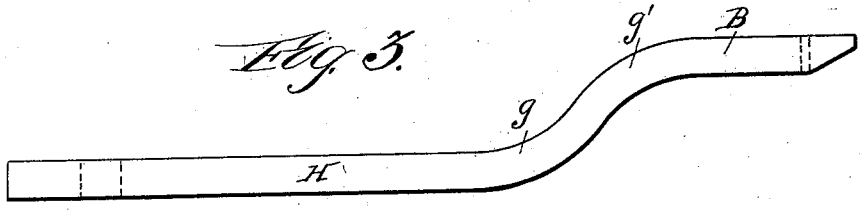
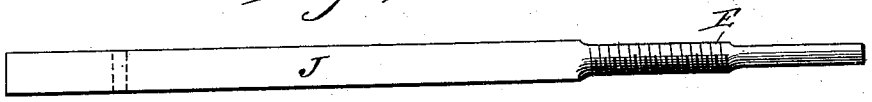


Fig. 4.



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UNITED STATES PATENT OFFICE.

FREDERICK H. BROWN, OF CHICAGO, ILLINOIS.

MAGNETIC TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 523,927, dated July 31, 1894.

Application filed November 25, 1893. Serial No. 491,927. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK H. BROWN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Magneto-Telephones, of which the following is a specification.

My invention relates to that class known as magneto telephones, in which a current is generated by the vibration of a diaphragm in a field of magnetic force and has particular reference to the character of permanent magnets arranged in juxtaposition to the said diaphragm and establishing said magnetic field.

My invention is designed to relieve the magnetic stress upon the diaphragm, which stress retards the free unrestricted vibratory movement of the diaphragm through the magnetic field of force and limits and retards said diaphragm under the impinging influence of the sound waves from resolving itself into vibrations of a maximum amplitude and thereby limits and circumscribes the volume of generated current.

My invention is also designed to afford such a construction and arrangement of the two pole pieces of the magnet as that the same may be made at a minimum cost and adjusted and held together with the least labor.

To accomplish these ends my invention consists primarily in a bifurcated permanent magnet, the one leg or arm of which magnet has a greater mass or cross section of metal therein relatively to the other leg or arm of the bifurcated magnet, both of these legs or arms being of the same polarity while the extended arm is of a different polarity than that of the two said legs or arms, this variation in the mass or cross section of metal of the bifurcations providing two magnetic poles of varying relative strength, one of which poles being connected directly and electrically with the diaphragm, while the latter is free to vibrate over the other pole and through the magnetic field of force established thereby.

My invention consists further in a magnet which when complete and the parts joined together provides two arms constituting pole pieces of the same polarity, one of said arms or pole pieces being immediately in contact with the diaphragm and the other positioned in proximity thereto and within inductive area thereof and extensions secured to or formed with said arms adapted to be joined and held together to form a pole piece of a polarity opposite to that of the two arms or pole pieces of the same polarity.

My invention consists further, in conjunction with the diaphragm of a magneto telephone, of a permanent magnet having two arms or pole pieces, one of which is in contact with the said diaphragm and the other arm or pole piece positioned in proximity thereto and within inductive area thereof, so that the diaphragm is adapted to move or vibrate freely over and through the field of force established by the same and which two arms are of the same polarity, and extensions integral with said arms extended in such a manner as that when positioned together, they are in the same plane side by side and are thus adapted to be joined together and form a single pole piece of a polarity opposite to that of the two arms or pole pieces.

My invention consists further in the form and construction of the two members or elements which go to make up the complete magnet, the one member being approximately straight and the other having a double elbow shaped bend therein, and also in certain other features and details of construction hereinafter to be described and pointed out in my claims, reference being now had to the accompanying drawings, in which—

Figure 1 is a sectional view of a telephone instrument, the magnet being shown in full lines, this view illustrating the relation of my improved form of magnet to the diaphragm of the instrument. Fig. 2, is a side view of the magnet shown detached from the diaphragm of the instrument and also showing the means of holding the two members together. Fig. 3, is a like view of one isolated member of the magnet. Fig. 4, is a like view of the other member.

It is well understood, in magneto telephones, that the diaphragm is ordinarily under retarding stress from the juxtapositioned magnet and that its free vibration is limited and circumscribed thereby and it is obvious that the greater the strength of the magnet the greater will be this retardation.

In my type of magnet, designated at A, I provide the diaphragm energizing arm B,

which arm is brought and held in contact with the diaphragm C (Fig. 1) near the outer periphery of the said diaphragm, the said arm B being secured to the inclosing box D by means of the screw *d*.

In analogy to a magneto electric generator the magnet E may be termed the field magnet, at its end in juxtaposition to the center of the diaphragm, but not in contact therewith so that a field of magnetic force is generated, the lines of which are cut by the vibration of the diaphragm therein, which vibrations are produced in the ordinary manner by the impinging influence of the sound waves.

The diaphragm energizing arm B constituting one member of the magnet A has the two elbow shaped bends *g*, *g'*, thus providing means by which the extension piece H may be arranged in the same plane with and secured side by side to the extension J, by means of the pin *j*. It will be observed that the cross section of the material of the arm B is greater than that of the arm E and that therefore the former is of a greater magnetic strength than the latter so that the diaphragm C is energized or charged with magnetism greater than the strength of the field of force established by the field magnet arm or pole piece E, and it is further evident that the magnetism passing into the diaphragm C from the pole piece or arm B is transmitted to all parts of the total area of the diaphragm and thereby diffused and not concentrated at any point.

Each of the two members of the magnet comprising the arm B, extension H, arm E and extension J is so magnetized as that the two arms B and E are of the same polarity, viz., as shown, of north polarity, while the two united and joined extensions H and J provide a single pole of opposite polarity, viz., as shown, of south polarity. By this arrangement and construction therefore the diaphragm becomes energized and of the same polarity as that of the field magnet pole piece E, the magnetism in the said diaphragm diffusing itself over the whole area of the same so that the retarding inductive influence of said field magnet pole piece or arm E is neutralized and overcome, permitting free and unrestricted vibrations of the diaphragm in the field of force.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States, is—

1. In an electrical telephone apparatus, the combination with the diaphragm thereof, of a magnet having two arms or pole pieces of the same polarity and an extension pole piece of opposite polarity, one of the two said arms or pole pieces of same polarity being in electrical contact with the diaphragm at or near its perimeter and the other arm or pole piece being located in such juxtaposition to the diaphragm as that the latter is free to vibrate within the magnetic field thereof and cut the lines of force established thereby, that arm or pole piece in contact with the diaphragm being made up of a greater cross section or quantity of material than that arm or pole piece establishing the magnetic field of force.

2. In an electrical telephonic apparatus, the combination with the diaphragm thereof, of a magnet arranged in juxtaposition to said diaphragm, said magnet being composed or made up of two members providing two extensions which extensions are joined and held together and constitute one pole piece of one given polarity and also two arms or pole pieces of the same polarity, one of which is in electrical contact with the diaphragm at or near its perimeter and the other located in such a position as that said diaphragm is adapted to vibrate within its field of force.

3. In a telephonic apparatus the combination with the diaphragm, of a magnet made up or composed of two members, one of which members is straight in form and has its one end in juxtaposition to the center of the diaphragm, the other one of said members having a double elbow shaped bend in its length to form a pole piece which is adapted to be brought in electrical contact with the diaphragm at or near its perimeter and providing an extension adapted to be joined to the first mentioned member to form a single pole piece of one given polarity, the ends of the members in juxtaposition to the diaphragm and in electrical contact therewith being of the same polarity relative to one another and of an opposite polarity to that of the single pole piece.

4. In a telephonic apparatus the combination with the diaphragm, of a magnet made up or composed of two members, one of which members is straight in form and has its one end in juxtaposition to the center of the diaphragm, and the other one of said members having a double elbow shaped bend in its length to form a pole piece which is adapted to be brought in electrical contact with the diaphragm at or near its perimeter and providing an extension adapted to be joined to the first mentioned member to form a single pole piece of one given polarity, the ends of the members in juxtaposition to the diaphragm and in electrical contact therewith being of the same polarity relative to one another and of an opposite polarity to that of the single pole piece, that pole piece in contact with the diaphragm being made up of a greater cross section or quantity of material than that pole piece establishing the magnetic field of force.

FRED. H. BROWN.

Witnesses:
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