(No Model.)

J. W. McDONOUGH.

TELEPHONE.

No. 246,800. Patented Sept. 6, 1881.

Fig: 1.

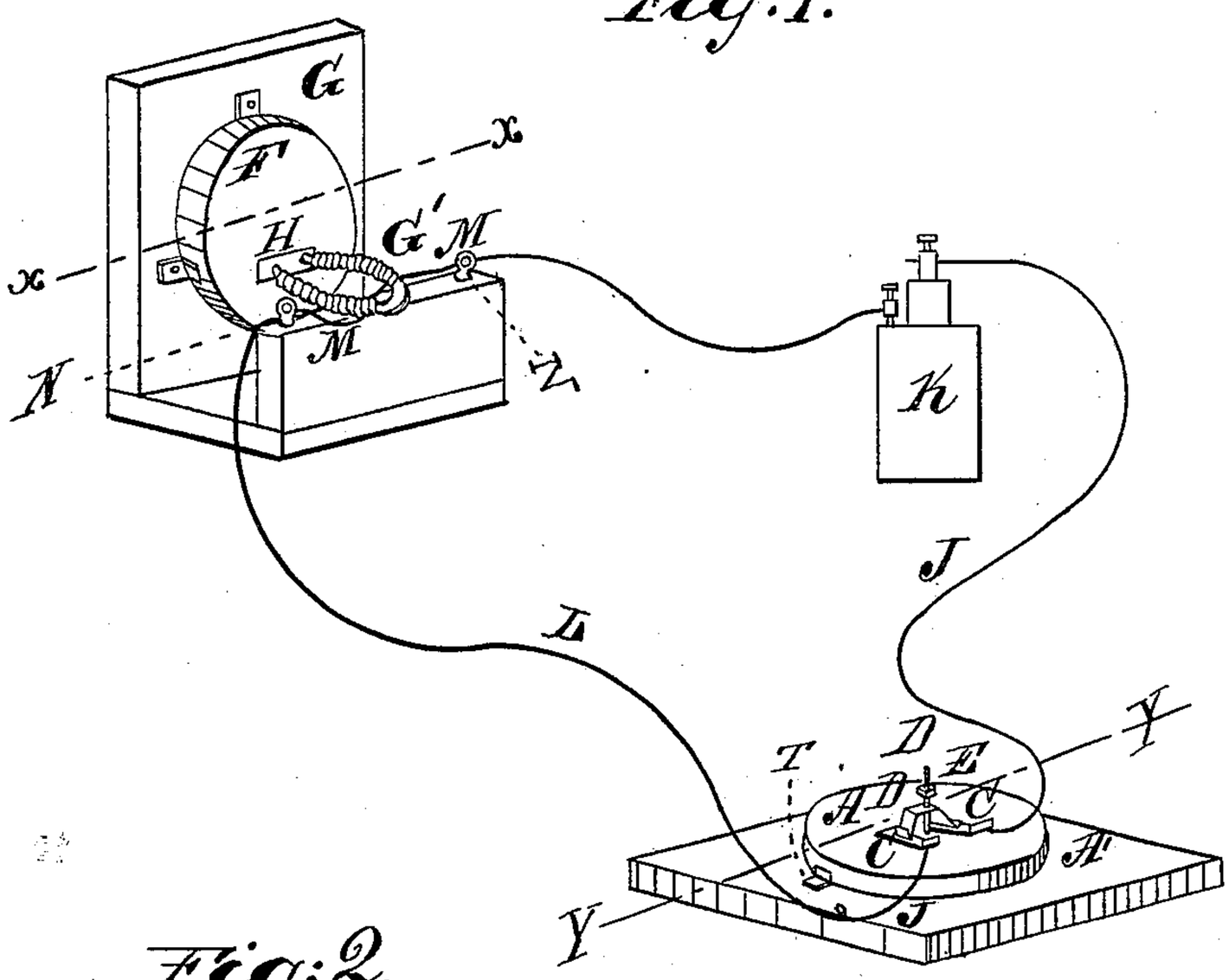


Fig: 2.

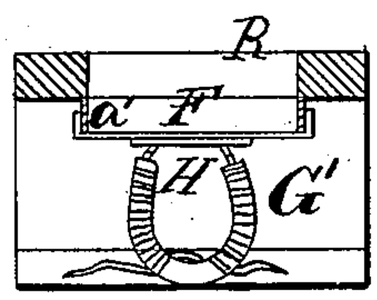


Fig: 3

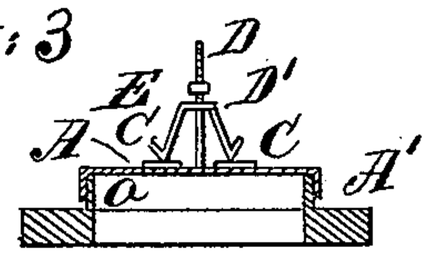
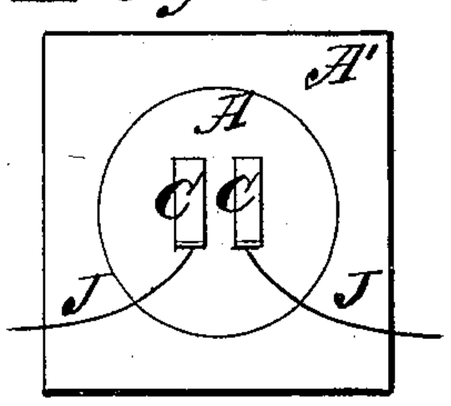


Fig: 4:



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TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 246,800, dated September 6, 1881.

Application filed May 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. McDONOUGH, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Telephone, (for which I made an application for patent April 10, 1876;) and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings.

The general object of my invention, as I have set forth in my original application and in other divisions thereof filed of even date with this division, is to provide a means for transmitting articulate sounds from one place to another through the medium of electricity; but the part of my invention to which this present division of my said application appertains consists in a certain combination of mechanism, specifically set forth in the claim at the end of this schedule.

In other divisions of my said application of April 10, 1876, filed at an even date with this present one, I have specified and claimed other combinations or subject-matters, which, so far as this division is concerned, are not here claimed, but are specified at the end of this present schedule.

In order that persons skilled in the art may understand, make, and use my present invention, I will proceed to describe the manner in which I have constructed and combined the parts together in a telephone apparatus.

Figure 1 represents a perspective view of the telephone apparatus embodying my said invention. Fig. 2 represents a sectional plan of the receiver, taken on line X X, drawn across Fig. 1. Fig. 3 represents a vertical transverse section of the telephone-transmitter, taken on line Y Y; and Fig. 4 represents a general plan or top view of the same.

Like letters of reference indicate like parts.

In the drawings, A represents the transmitting membrane or apparatus, composed of vellum or any suitable material that is sensitive to the vibrations of sound, which is stretched upon a metal hoop or band, *a*, attached to the bed A′ by angle-pieces T, Fig. 1. C C are metal plates, of German silver or such like material, attached to the upper surface of the membrane A and insulated from each other.

D is a metal bolt, permanently attached at its lower end to said membrane A, centrally between the plates C C, is insulated from them, and provided with adjusting-nut E.

D′ is the circuit-controller, which consists of an arched-shaped piece of German silver or like material, loosely secured at its center upon the bolt D, and bent upward at each end from the membrane A, as shown in Fig. 3, so as to form depending V-shaped legs adapted to rest upon the respective plates C C, and to make contact between part of their granular surfaces and the granular surfaces of the plates, in the manner set forth in the several divisions of my original application relating specifically to the transmitter.

F is the receiving or sounding membrane, which is also composed of vellum or any suitable material that is sensitive to the vibrations of sound, and is stretched upon a metal hoop or band, *a′*, secured to side frame, G, of the receiving or sounding apparatus, as shown in Fig. 1.

G′ is the magnet, surrounded by a helix of insulated wire, and connected to the instrument immediately in front of the membrane F, and at a point near its center. H is a thin metal armature-plate, permanently attached to and supported by the membrane F, between it and the magnet, as shown in Fig. 1, so that the membrane receives the exact and entire motion of its whole area.

R is a sound-recess in the frame or holder of the receiver, inclosed on its sides or circumference by the wood of the frame G, and on the end near the magnet by the membrane, so that the sounds received by the armature and membrane may be confined and directed to the ear of the listener.

To each of the plates C C is connected a wire, J, one of which is connected with the battery K and the other with the ground-wire L.

To the poles of the magnet are connected wires M, one of which is connected with the battery K and the other to the ground-wire, as shown in Fig. 1, by means of connecting-posts N N.

The operation of my telephone apparatus is

as follows: The transmitting-membrane being at rest, the circuit-controller rests on the plates and completes the circuit of the electric battery through the helix of the receiver, and the current flows in proportion to the amount of contact. The said membrane, being sensitive to sound-vibrations produced in its vicinity, is made to vibrate thereby, and the flow of the electricity through the wires of the helix is thereby controlled by the action of the circuit-controller D′, resting upon the plates C C. By these means the magnet G′ is caused to alternately attract and release the armature H, causing it and the membrane F to vibrate in response to the action of the transmitter when affected by sound waves or vibrations.

Having now fully described my invention of a telephone apparatus, as shown and set forth in the drawings and specification filed in the Patent Office April 10, 1876, I wish it to be understood that in this present division of my application I make no claim to the telephone-transmitter, that being here shown merely to indicate the manner in which I have combined it and my telephone-receiver to form an improved telephone apparatus.

In this present division I do not, therefore, claim the subject-matter claimed in the other divisions of my original application filed of even date with this present division, which claims, as contained in the several divisions now on file and the division patented August 9, 1881, No. 245,534, are as follows:

"1. A telephone-receiver consisting of the combination, in an electric circuit, of a magnet and a diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced accurately as to pitch and quality, substantially in the manner hereinbefore set forth.

"2. The combination, substantially as hereinbefore set forth, for a telephone-receiving apparatus, of a helix and magnet, and connecting-posts, to which the wires of the helix are joined, mounted in one end of a frame or holder of wood or such like insulating material, a membrane mounted on the opposite end of said frame or holder, a portion of the face of which membrane presents a material, attached to and supported wholly thereby, capable of being attracted by the magnet and in close proximity thereto, so that the said membrane shall be caused to vibrate by the action of pulsations in an electric current in the helix around the magnet, with a sound-recess at the opposite side of the membrane from the magnet to confine the sounds received therein and exclude exterior sounds from the ear of the listener, and adapted at the same time to allow the ear of the listener to be placed in close proximity to the membrane, all constructed and arranged to operate substantially in the manner described.

"3. The combination, substantially as hereinbefore set forth, of a transmitting-membrane composed of vellum, or any suitable material that is sensitive to the vibrations of sound, and a piece or pieces of conducting material connected with the same and receiving from it vibrations less in extent than its extreme range of vibration with a circuit-controller, which, when at rest, has points of contact with said conducting piece or pieces, making part of an electric current through them and the battery, and which receives from the membrane, when in motion, said reduced vibrations in accord with the waves of air, producing sound, and thereby causes impulses in the electric current through the said conducting piece or pieces, all constructed and operating substantially in the manner described.

"4. Broadly, the art of transmitting articulate speech by electricity.

"5. Broadly, a variable resistance contact-transmitter for electro speaking-telephones.

"6. Broadly, a magneto-receiver for electro speaking-telephones.

"7. The combination, substantially as hereinbefore set forth, of a transmitting-membrane composed of vellum, or any suitable material that is sensitive to the vibrations of sound, and a piece or pieces of conducting material receiving motion from the same, and a circuit-controller provided with means for adjustably controlling its vibrations in relation to said plate or plates and membrane, substantially as described."

What I claim in this division of my application, and wish to secure by Letters Patent, is—

The combination, substantially as hereinbefore set forth, of a magnet, a helix, and a receiving-membrane, a portion of the face of which presents a material, attached to and supported wholly by the membrane, capable of being attracted by the magnet and in close proximity thereto, with connecting-wires, a voltaic battery, and a transmitting-membrane, conducting-pieces connected thereto and to the circuit-wires, a circuit-controller resting upon said pieces and entirely supported thereby and arranged to vibrate in connection with the membrane, and a regulating-nut to limit the movement of the controller with relation to said contact-pieces, all combined to operate in the manner set forth, so that the said controller, when at rest, completes the circuit of the battery, and when in motion, by means of sound-waves, causes electrical pulsations in the connecting-wires and helix around the magnet and vibrations of the membrane of the receiver.

JAMES W. McDONOUGH.

Witnesses:
JOSEPH A. SMITH,
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