

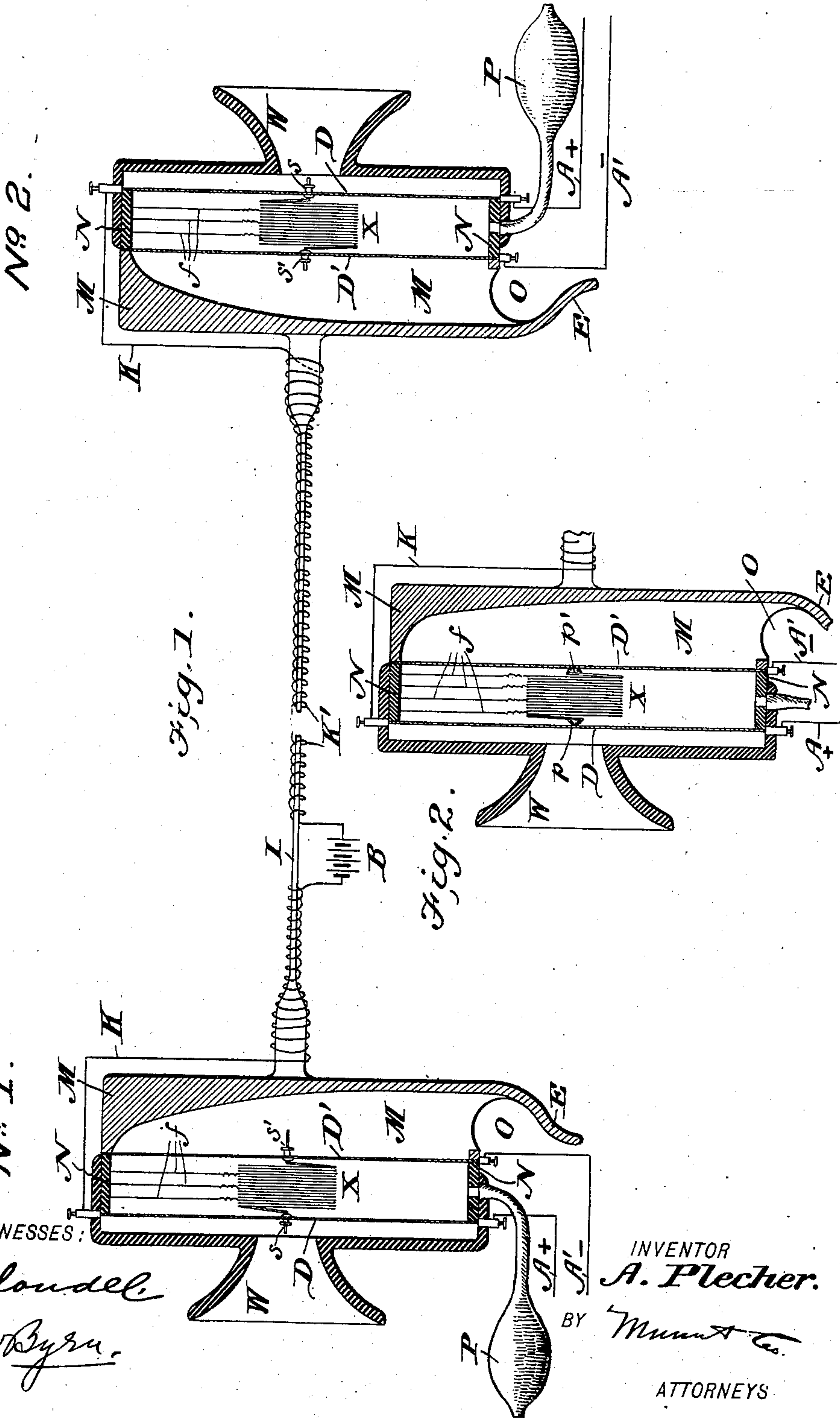
No. 655,113.

Patented July 31, 1900.

A. PLECHER.  
ELECTROMAGNETIC TELEPHONE.

(Application filed Feb. 16, 1900.)

(No Model.)





# UNITED STATES PATENT OFFICE.

ANDREW PLECHER, OF SAVANNAH, GEORGIA.

## ELECTROMAGNETIC TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 655,113, dated July 31, 1900.

Application filed February 16, 1900. Serial No. 5,443. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW PLECHER, of Savannah, in the county of Chatham and State of Georgia, have invented a new and useful Improvement in Electromagnetic Telephones, of which the following is a specification.

My invention is in the nature of an electromagnetic telephone transmitter and receiver which may also be used as a repeater; and it consists in the peculiar construction and arrangement of parts acting upon new principles, as will be hereinafter fully described with reference to the drawings, in which—

Figure 1 represents a sectional view of two combined transmitters and receivers connected at the opposite ends of a line and marked Nos. 1 and 2, and Fig. 2 shows a further development of the same.

M is an iron magnetic box which by an iron wire I is connected to a similar iron box at the other end of the line.

D and D' are two thin iron diaphragms, which are insulated from each other by a non-conducting marginal ring N, whose joint with the diaphragms is perfectly air-tight.

P is a hand-pump constructed conveniently as a rubber bulb and which by compression is enabled to place the air in the hermetically-sealed chamber between diaphragms D D' under a regulable tension for the purpose hereinafter described. Behind the diaphragms in the box M there is a chamber having an external opening O, preferably at the bottom, and provided with a lip or ear E, extending down below it for the admission and egress of air and sound-waves.

K is an insulated copper wire connected at one end to one pole of the battery B and after being wound around the central stem of the iron box is connected by a binding-post to the front diaphragm D. This winding makes a magnet of the box M and iron wire I. This wire K has at K' a counterpart which connects with the other pole of the battery and is wound continuously around the larger iron wire I all the way to the next station, No. 2, and there connects with the box M and diaphragm D in the same way as at No. 1. The wire I is a large iron wire, and K' is a small silk-covered wire whose cross-section and winding are such as to give it the same resistance as the larger iron wire I.

Between the two diaphragms D and D' there is suspended by silk threads *f* a coil X of fine wire, preferably iron, whose surfaces are bare and wound so that the individual turns nearly touch each other. One end of this coil is electrically connected to one diaphragm D and the other end to the other diaphragm D', the connection being made by adjusting screws *s s'* to regulate the tension of the coil. When an electric current passes through this coil, the individual turns will touch, since the coil becomes magnetic. The vibrations of the diaphragms will separate or bring into contact the individual turns of the coil, whereby resistance is thrown in or eliminated from the circuit, and this causes a corresponding fluctuation of the current. That this may be better understood I would state that in the normal condition of the line, with the current passing through the coil X, its magnetic action causes the turns or convolutions to be attracted to a partial lateral contact. Then when the vibrating diaphragms move outwardly this lateral contact between the convolutions is broken and the resistance of the whole coil will be thrown in by compelling the current to traverse the coil lengthwise instead of jumping across from convolution to convolution by a short-circuiting contact. When the voice produces air vibrations, these act through the mouthpiece W on the front face of the diaphragm D and also entering opening O act on the back face of the diaphragm D', causing the two diaphragms to vibrate in opposite directions and augmenting the effect on the resistance-varying coil X one hundred per cent. The fluctuations are transmitted over the double line both by electrical current and by magnetism on account of the arrangement of the wires K' and I.

In the action of the telephone the circuit is made as follows: from battery B to wire K, diaphragm D, resistance-coil X, diaphragm D', iron box M, iron wire I to the iron box of the other station, No. 2, thence to the diaphragm D' of that station, through the resistance-coil X of that station, to diaphragm D, and thence by wire K K' back over the line to the other side of battery B.

The object of the air-bulb P is to cause the hermetically-sealed chamber between



the diaphragms to be expanded or collapsed to regulate at will the amplitude of movement of the turns of the coil X.

I do not claim, broadly, an air-bulb for exhausting the air behind a telephone-diaphragm, as I am aware that this is old. I am also aware that double diaphragms with resistance-varying media between them are old and I make no broad claim to the same.

In using this telephone for a repeater it is only necessary to connect the two diaphragms D and D' with two circuit-wires A and A', respectively, and to carry these to a third telephone. I have shown a pair of wires A A' at both the station No. 1 and the station No. 2. These wires are mere duplicates of each other to connect a repeating-telephone with the instrument at either station No. 1 or No. 2.

In rendering my transmitter more sensitive I may construct it as shown in Fig. 2, in which the ends of the coil X have carbon buttons  $p p'$ , mounted on metal disks at the ends of the coil and in electric connection with the said coil and sustained only by the threads  $f$  and arranged to bear with an elastic pressure against the diaphragm-plates D D'.

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

1. A resistance-varying medium for a telephone consisting of a coil of fine bare wire of magnetic metal having separated turns or convolutions interposed in the circuit and arranged as described to collapse and reduce resistance from magnetic action substantially as set forth.

2. A resistance-varying medium for a telephone consisting of a coil of fine bare wire

of magnetic metal having separated turns or convolutions, combined with two diaphragms connected respectively to the opposite ends of said coil and vibrating in opposite directions as set forth.

3. A telephone comprising an iron box and an attached iron circuit-wire, an insulated wire wound around the said circuit-wire between stations to render the boxes magnetic; in combination with two diaphragms, and a variable-resistance medium between them substantially as described.

4. The combination in a telephone, of two diaphragms having between them a resistance-varying medium within a hermetically-sealed chamber and means for increasing or decreasing the air-pressure within said hermetically-sealed chamber substantially as described.

5. The combination with the diaphragm-plates D D'; of the interposed wire coil X having carbon pieces at its ends in elastic contact with the plates D D' substantially as described.

6. A telephone comprising an iron box M having an iron wire I connecting it to a similar iron box, a battery-circuit wire coiled about the same, said battery-circuit wire being connected with the iron box through a variable-resistance medium and a diaphragm substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW PLECHER.

Witnesses:

A. MCQUADE,  
PATRICK SMITH.