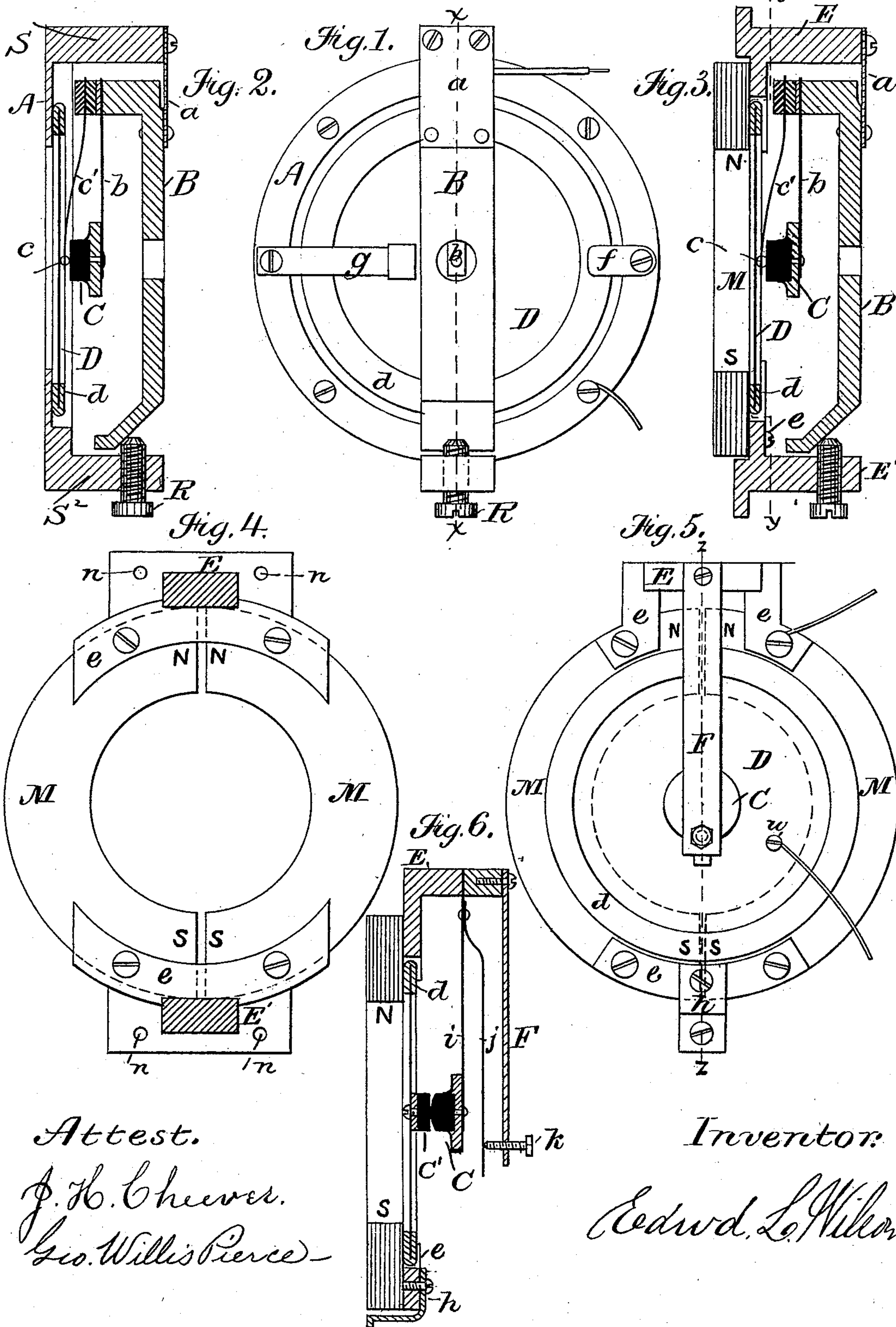


(No Model.)

E. L. WILSON.
TELEPHONE TRANSMITTER.

No. 275,310.

Patented Apr. 3, 1883.



Attest.

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UNITED STATES PATENT OFFICE.

EDWARD L. WILSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN BELL TELEPHONE COMPANY, OF SAME PLACE.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 275,310, dated April 3, 1883.

Application filed January 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. WILSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Telephone-Transmitters, of which the following is a specification.

My invention is an improvement in microphonic or contact telephones—such as are in common use as transmitters—and its objects, broadly stated, are to provide an improved method of supporting the diaphragm in place to minimize the cost, to simplify construction, and to dispense with parts which, while useful, by reason of their fragility and uncertainty of operation, are liable to cause annoyance both in construction and exploitation. In such transmitting-telephones it is well known that the current of a voltaic battery passing through two contact electrodes is varied. The vibrations of the diaphragm, developed by the action of the voice, thus act directly upon the contact-electrodes, varying their pressure upon one another, as a penultimate consequence producing variations in the resistance of the circuit, and as an ultimate consequence producing variations of strength in the current flowing in the circuit. Experience has demonstrated that all transmitting-diaphragms have distinct initial vibrations of their own, and when vibrations are produced in them from any external cause—for example, by vocal utterances in near proximity to them—it is difficult, and sometimes impossible, to obtain distinctness in the speech reproduced by the receiving-telephone unless the initial vibrations are first dampened or subdued. It has been customary to deaden these unnecessary and pernicious vibrations by clamping one edge of the diaphragm firmly to its seat by a metal clip, and by causing the other edge to be elastically held by a thin steel spring fastened at one end to the frame of the diaphragm-seat, and pressing with its free end, which is covered with a pad of some textile or elastic non-conductor—such as rubber or cloth—upon the inner face of the diaphragm. This device is used ordinarily in the well-known Blake transmitter, and is usually called a “damping-spring.” In practice these damping-springs have been productive of much trouble and annoyance in the course of manufacture and process of testing the transmitters, as well as during the operative life-time

of the same. It has been found difficult to procure steel of the exact texture and temper required, and when such springs are procured they are frequently broken during the process of adjustment, which is a work of great delicacy. Moreover, when at work it is more or less difficult to maintain a proper adjustment. By my invention I am enabled to dispense with the damping-spring, and may, if desired, dispense also with other delicate parts, as will be hereinafter succinctly described.

My invention consists chiefly in providing a magnetic support or seat for the diaphragm, and in combining the same with the other parts of the instrument in such a manner that no other means of holding or damping the diaphragm are necessary.

In the drawings, which form a part of this specification, for greater perspicuity I show the working parts of an ordinary Blake transmitter in contrast with a similar instrument furnished with my improvement.

Figure 1 is an elevation of the working parts of a Blake transmitter seen from the rear. Fig. 2 is a sectional side elevation of the working parts of the same on the line *xx*, Fig. 1. Fig. 3 is a vertical section, showing my improvement. Fig. 4 is a sectional elevation on the line *yy* of Fig. 3, looking from the inside. Fig. 5 is a rear elevation, and Fig. 6 a section on the line *zz*, of another form of microphonic transmitter, also furnished with my improvement.

I will first briefly describe the Blake transmitter, which is depicted in Figs. 1 and 2.

A vibrative diaphragm, *D*, fringed with a rubber pad, *d*, which overlaps both edges, is supported in a ring-seat formed in a metal frame, *A*, which also has at top and bottom a projecting piece or lug, *S S*². From the upper lug, *S*, by means of a flat spring, *a*, an adjusting-lever, *B*, is suspended, which carries on an arm extending inward from its upper extremity the two contact-electrodes of the circuit *c* and *C*, the former being a small piece of platinum and the latter a button of carbon in a casing of metal. The platinum electrode is suspended from the arm of the lever by a light spring, *c'*, while the carbon is similarly suspended by a heavier spring, *b*, which is in electrical contact with the adjusting-lever, the spring *c'* being insulated therefrom, so that the only electrical contact between the two

springs is made through the platinum and
 carbon electrodes. An adjusting-screw, R,
 passes through the lower lug, S², and bears
 against the angular extremity of the lever B,
 and is screwed up until the platinum electrode
 is brought into contact with the diaphragm,
 and when so placed any vibration of the
 diaphragm is participated in by the electrode.
 A metal clamp, *f*, screwed to the iron frame
 presses tightly on the padded rim of the dia-
 phragm, and a damping-spring, *g*, on the
 opposite side, is similarly secured, and by its
 free end, which is padded, presses on the dia-
 phragm near its center and averts or obviates
 any noxious or unnecessary or unwarranted
 vibration.

In my improvement I replace the metal
 frame constituting the ring-seat by a pair of
 semicircular bar-magnets, M M, having like
 poles in juxtaposition, as shown in Fig. 4,
 wherein N N represent the two north and S S
 the two south poles. These magnets are held
 together and in place by brass brackets or
 standards *e*, which are screwed thereto at top
 and bottom, and which may also be screwed to
 the front board of the transmitter-box. The
 holes *n* are for the latter purpose. From the
 upper bracket extends the lug E and from the
 lower bracket the complementary lug E', which
 both subserve the same purpose, as in the or-
 dinary Blake transmitter. The damping-
 spring *g* and metal clamp *f* are both entirely
 dispensed with, since it is found that by form-
 ing the diaphragm-seat of magnetic material
 the diaphragm is both efficiently supported
 and controlled.

In Figs. 5 and 6 I show another form of con-
 tact-telephone to which my invention is ap-
 plied. In this form also the diaphragm is held
 by magnetism alone, and the platinum elec-
 trode, with its delicate suspending-spring, is
 superseded by a conducting-electrode, C', rig-
 idly secured to the diaphragm D. This is lightly
 pressed upon by the usual spring-suspended
 carbon button, C, and the initial pressure is
 given by combining an auxiliary spring, *j*, riv-
 eted at its upper end to the suspending-spring
 of the button, with a metal bar, F, fastened
 at its end thereof to the abutment or lug E,
 and provided at its lower and free end with an
 adjusting-screw, *k*, passing through the said
 bar and against the free end of the auxiliary
 spring. By means of this device a delicate
 but firm initial pressure may be obtained be-
 tween the electrodes.

The electrode C' is brought into the voltaic
 circuit by fastening one of the wires thereof to
 the diaphragm, as shown in Fig. 5. In this
 form of instrument there is a small bent piece,
h, fastened to the lower bracket, *c*, for attach-
 ing the transmitter to the front board of the
 transmitter-box.

Although I have shown the magnets form-
 ing the frame or seat of the diaphragm as be-
 ing semicircular, I may, without departing
 from the spirit of my invention, form the same
 of a complete or closed circular magnet; or I

may use four quadrantal magnets, it being
 evident that in this case form is not of para-
 mount importance. I may also, if I so elect,
 place opposite instead of like poles in juxta-
 position.

I claim—

1. In a battery-telephone, the combination,
 with the diaphragm, of a permanently-mag-
 netic frame or support adapted by the force of
 the magnetism to hold the edges of said dia-
 phragm, substantially as described.

2. In a battery or variable-resistance tele-
 phone, the combination, with the diaphragm,
 of a magnetic frame or support, the magnetism
 of said frame or support being independent of
 the current upon the line, substantially as de-
 scribed.

3. The combination of the diaphragm, mag-
 netic frame therefor and contact-pieces or
 electrodes, substantially as described.

4. In a telephone, the combination, with the
 diaphragm, of a frame or support comprising
 one or more permanent magnets, substantially
 as described.

5. In a telephone, the combination, with the
 vibratory diaphragm, of a seat or support
 therefor comprising curved or semicircular
 magnets, so disposed as to attract and hold
 the diaphragm at its edges only, substantially
 as described.

6. A telephone-transmitter consisting of a
 vibrating diaphragm, a circular or double
 semicircular magnetic frame therefor, brackets
 of non-magnetic metal attached thereto—one
 on each side—and forming a partial ring-seat
 for the diaphragm, combined with the circuit-
 electrodes composing the variable resistance,
 and devices for adjusting the initial pressure
 of the same, substantially as hereinbefore de-
 scribed.

7. The combination, substantially as here-
 inbefore described, of a vibrating diaphragm
 adapted to control the electrodes of a variable-
 resistance transmitter, with two semicircular
 magnets placed with like poles in juxtaposi-
 tion, and two non-magnetic yoke-pieces there-
 for, uniting the said magnets and forming
 thereon a seat or support for the said dia-
 phragm, in which it is magnetically held.

8. The combination, substantially as de-
 scribed hereinbefore, of a vibrating diaphragm,
 a frame composed of two semicircular mag-
 nets held together by non-magnetic yokes, the
 said yokes extending inwardly and forming,
 with the magnetic frame, a holder or seat for
 the diaphragm, whereby the said diaphragm
 is freed during its operation from hurtful vi-
 brations, independently of the employment of
 a damping-spring.

In testimony whereof I have signed my name
 to this specification, in the presence of two sub-
 scribing witnesses, this 25th day of January,
 1883.

EDWD. L. WILSON.

Witnesses:

J. H. CHEEVER,

GEO. WILLIS PIERCE.