

(No Model.)

J. T. WILLIAMS.
TELEPHONE TRANSMITTER.

No. 530,315.

Patented Dec. 4, 1894.

Fig. 1.

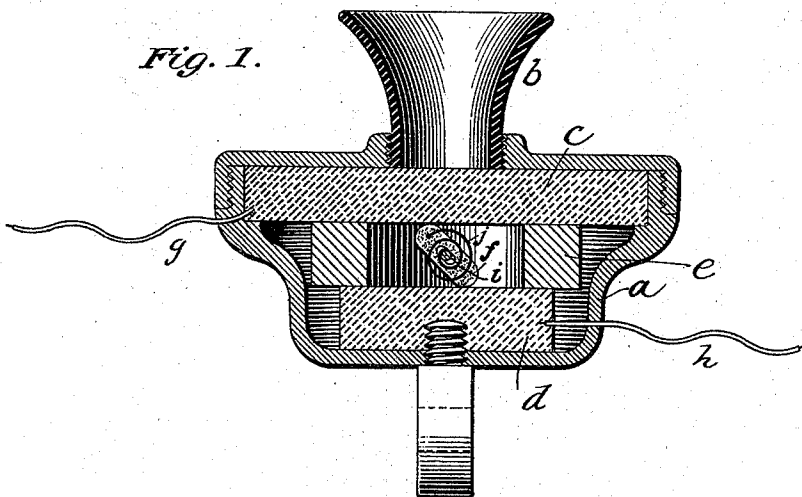


Fig. 2.

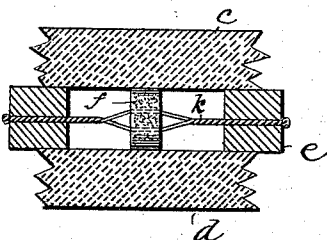


Fig. 3.

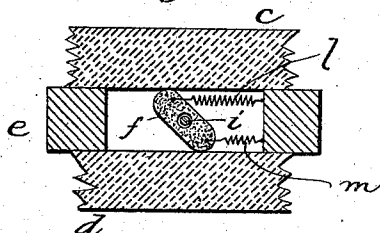


Fig. 4.

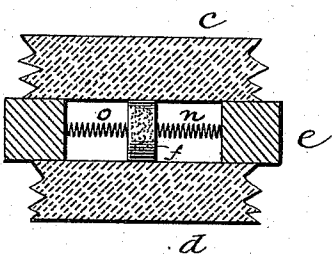
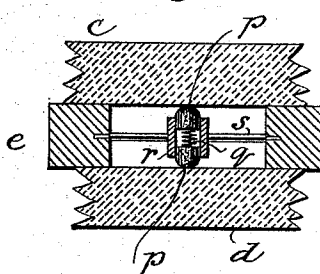


Fig. 5.



WITNESSES:

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JOHN T. WILLIAMS, OF BROOKLYN, NEW YORK.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 530,315, dated December 4, 1894.

Application filed August 8, 1894. Serial No. 519,732. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. WILLIAMS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Telephone-Transmitters, of which the following is a full, clear, and exact description.

This invention relates to telephone transmitters and has special reference to the class of instruments known as the "molecular," in which the ordinary vibratory diaphragm or element is eliminated.

The object of this invention is to produce an instrument capable of impressing upon an electric circuit, electrical waves, undulations or pulsations which shall be exactly like the waves, undulations or pulsations of the atmosphere which are created by any sound, more particularly articulate speech, so that such sounds may be perfectly reproduced in a receiving instrument connected in the same circuit.

In general terms my transmitter may be said to consist of two independent bodies of conducting material, incapable of mechanical vibration, in combination with a third body suspended between the first two and acted upon by a force to hold it in contact with both.

The invention also consists of a flexibly suspended conducting body subjected to torsional strain and forming a portion of the circuit within the transmitter.

The invention is capable of numerous mechanical embodiments and I have taken occasion to illustrate and describe several different forms, and it is to be understood that the invention comprehends any and all forms embodying the structure above described.

In the accompanying drawings, Figure 1 is a sectional view of a transmitter constructed in accordance with my invention. Figs. 2, 3, 4 and 5 are modifications thereof.

The instrument is inclosed within a case *a* of any form or construction. It is provided with an opening to which is fitted the usual trumpet-shaped mouth-piece *b*. Directly in front of this opening is mounted a block *c* of carbon, metal or other conducting material which is of such form and dimensions as to be incapable of mechanical vibration by at-

mospheric sound waves. It is fixed within the casing in as rigid a manner as possible in order to prevent the slightest bodily movement.

d represents a block of conducting material, similar to or different from that of which block *c* is composed. This block is also constructed and mounted to be incapable of mechanical vibration or bodily movement from atmospheric sound waves. The two blocks are held apart by a spacing block or frame *e* of non-conducting material and in the space thus formed between them is suspended a comparatively small piece of conducting material *f* preferably carbon. The method of mounting this piece is any form of suspension which will tend to maintain constant contact between the piece and both of the blocks *c* and *d*. The piece itself is oblong in shape and provided with rounded smooth ends. The piece may be hung at the center in any manner and a force applied to swing it upon its axis and thus bring its ends into contact respectively with the blocks *c* and *d*.

In Fig. 1 the piece is loosely mounted upon a shaft *i* and a light spiral spring *j* is fixed at one end to the shaft and at the other to the piece. The tendency of the spring is to rotate the piece and hold its ends against the blocks, pressing upon each with the same degree of force. The piece *f* forms a bridge between the two blocks, the latter being the terminals of the circuit as shown by the wires *g* and *h*.

In the operation of the instrument the sound waves enter the mouth-piece *b* and impinge upon the block *c*. They set up molecular movement in the block but no bodily movement. The molecular movement is communicated to the bridge-piece *f* and thence to the second block *d*. In passing the two points of contact the flow of current is disturbed and thus electric waves are produced in the circuit similar to the sound waves entering the mouth-piece of the instrument.

In Fig. 2 the bridge-piece *f* is shown provided with two holes through which two cords *k* pass, the ends of the cords being twisted and held under tension to create torsion. This form is found to be very effective and produces a very sensitive instrument, as it is

better suspension than the form shown in Fig. 1, the shaft in the latter causing more or less friction.

In Fig. 3 two springs l, m act against each other on the ends of the bridge-piece. One spring is weaker than the other and so acts to equalize or balance the forces.

Fig. 4 shows two spiral springs n, o , one right hand spiral and the other left hand, taking the place of a shaft and also furnishing torsion. In Fig. 5 the bridge-piece is in two parts p with a spring q between them and all confined in a sleeve r held rigidly by a rod s or other means. The spring in this case gives the constant pressure. It will be observed that in all these forms the bridge-piece is free to shift its position in a direction perpendicular to the surfaces against which it impinges, so that regardless of the amount of torsion acting, it will always produce the same pressure on each of the blocks c, d . It is this result which I believe to be responsible for the efficiency and accuracy of the instrument. It may be stated that the bridging piece is mounted upon a movable axis, it being understood that the axis is an imaginary line midway between the extremities of the bridging piece and at right angles thereto. In such a construction the bridging piece is always self adjusting with respect to the two blocks and therefore will always assume its proper working position whenever it is displaced by jars or other disturbing forces.

In Fig. 5 the two extremities of the bridging piece are movable, but a motion of one is communicated to the other through the spring and both must always exert the same pressure upon their respective blocks.

I claim as my invention—

1. In a telephone transmitter, the combination of two fixed conducting blocks or bodies, both incapable of mechanical vibration from atmospheric sound waves, and a bridging piece between them, mounted upon a movable axis and subjected to a force tending to hold its extremities in contact with the respective blocks or bodies.

2. In a telephone transmitter, the combination of two conducting blocks or bodies, both incapable of mechanical vibration from atmospheric sound waves, and a swinging bridg-

ing piece between the two held in constant contact with both by a torsional strain.

3. In a telephone transmitter, two blocks of conducting material constructed and mounted to be incapable of mechanical vibration and separated from each other, in combination with a bridging piece of conducting material suspended upon a flexible axis and constantly under a torsional strain to maintain contact with both blocks, substantially as described.

4. In a telephone transmitter, two blocks of conducting material constructed and mounted to be incapable of mechanical vibration and separated from each other, in combination with a bridging piece of conducting material suspended upon two cords which pass through two perforations in the piece and are twisted together and under longitudinal tension for the purpose set forth.

5. A telephone transmitter consisting of two fixed circuit terminals, in combination with a conducting body forming an electrical bridge between them and mounted upon a movable axis whereby it may automatically adjust its position with relation to the terminals.

6. A telephone transmitter consisting of two circuit terminals, in combination with a conducting body forming an electrical bridge between them and mounted upon a movable axis whereby it may automatically adjust its position with relation to the terminals.

7. A telephone transmitter consisting of two fixed terminals of a circuit, a bridge piece of conducting material located between the terminals and mounted upon a pivot located between the extremities of the piece, the said piece being subjected to a force which tends to maintain its extremities in contact respectively with the said terminals, substantially as described.

8. In a telephone transmitter, a section of the circuit consisting of two terminals in combination with a flexibly suspended conducting body subjected to a torsional strain to hold it in contact with both of said terminals.

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

JOHN T. WILLIAMS.

Witnesses:

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