

(No Model.)

E. G. ACHESON.
TELEPHONE TRANSMITTER.

No. 472,243.

Patented Apr. 5, 1892.

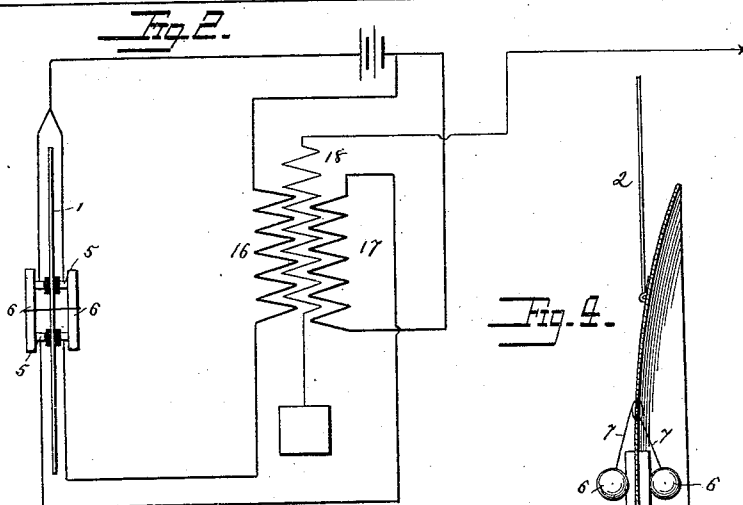
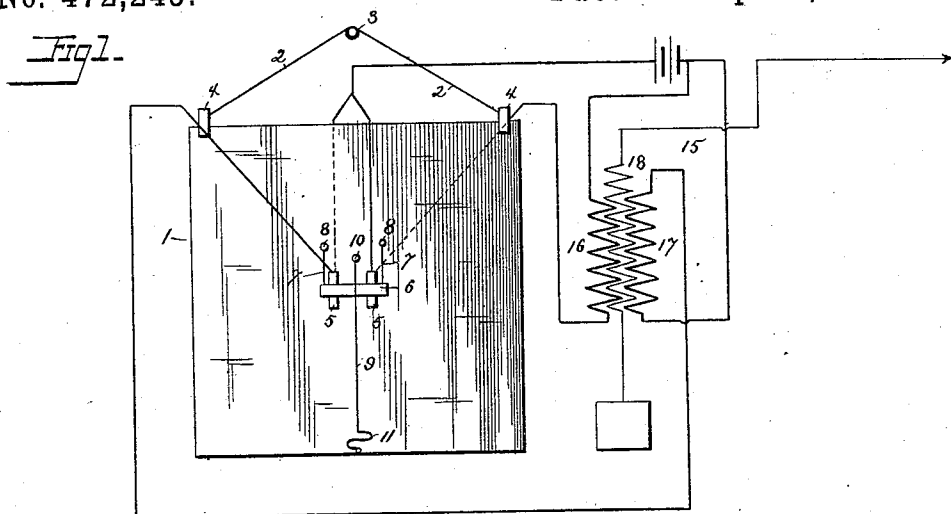


Fig. 3.

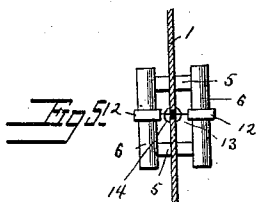
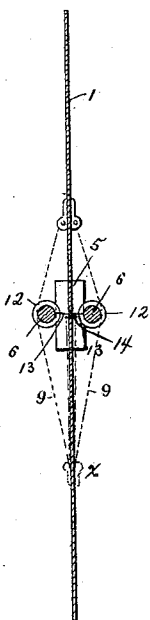
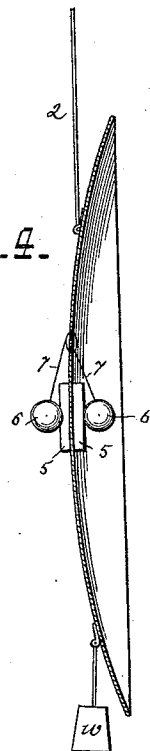


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD G. ACHESON, OF PITTSBURG, PENNSYLVANIA.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 472,243, dated April 5, 1892.

Application filed June 29, 1887. Serial No. 242,883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. ACHESON, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Telephone-Transmitters, of which the following is a specification.

My invention relates to telephone-transmitters; and it has for its object to improve the construction and arrangement of such instruments, so that they will be simple, cheap, and effective, less liable to get out of order, self-adjusting, and sensitive to very slight sounds; and my invention consists in a telephone-transmitter constructed substantially as hereinafter described.

Referring to the accompanying drawings, Figure 1 is a diagrammatic view showing the essential features of my telephone and the manner of connecting the circuits. Fig. 2 is a similar diagrammatic illustration showing the arrangement of contacts upon the plate and electrical connections therewith. Fig. 3 is a transverse section showing the manner of supporting and adjusting the electrodes. Fig. 4 is a view illustrating a modified form. Fig. 5 is a detail.

In carrying out my invention I make use of a plate 1 of any suitable material, whether of metal, glass, wood, or equivalent, and in any desired shape, whether round, square, or otherwise, and this plate is freely suspended in any suitable manner, as by the cords 2, extending from a support 3 and secured to the edges of the plate at 4. The plate is therefore free to vibrate bodily under the impact of sound-waves. Upon this plate, preferably at or near the center thereof, is mounted a number of small blocks or buttons 5, of carbon or similar material, and if the plate is of conducting material these blocks, of course, are suitably insulated from the plate. Two or more of these blocks are preferably mounted upon each side of the plate, as shown in Figs. 2 and 3.

Resting upon each pair of blocks 5 is a bar 6 of carbon or other material, and these bars are suspended by means of cords or threads 7, which are secured to the plate at some convenient point, as at 8, so that the bars rest by gravity upon the blocks.

While I have found in some instances that it is not necessary to provide means for adjusting the pressure between the bars and blocks other than that caused by gravity, I prefer to provide some adjusting device whereby the initial contact between the bars and blocks may be adjusted and their contact maintained. Thus in Fig. 1 I have shown a spring or strip of rubber 9, one end of which is secured to the plate, as at 10, and the other end of which is preferably connected to an adjusting-wire 11, which wire is secured to the plate, and by this means it will be readily seen that the strip may be adjusted so as to cause the bars to bear with the desired pressure upon the blocks.

In Fig. 3 I have shown the bars 6 as provided with smaller rubber bands 12, as seen in plan view in Fig. 5, and these bands are connected by a thread 13, which may be tied or otherwise secured to the bands and which passes through an opening in the plate 1. This thread serves to maintain the bars in position on the blocks 5. Sometimes, however, I preferably secure a separate string or thread to each band on each bar and pass the threads through eyes 14, secured near the center of the plate, and secure the ends of the thread to the plate, as at the point marked *a*, the threads being indicated in Fig. 3 by dotted lines. This is a convenient way to hold the bars, as the threads can be adjusted more readily than when they are connected directly through the diaphragm. If the telephone is subjected to loud sounds which cause severe vibrations in the plate, I have found it desirable to provide additional elastic threads 9, which pass over the outside of the bars and tend to maintain them in contact with the blocks; but under ordinary circumstances these last adjusting-threads are not necessary.

In Fig. 4 I have shown another form of plate which I have found convenient to use and which consists of a plaque or dish-shaped plate of any suitable material, the blocks 5 being secured, as before described, at or near the center of the plate. In this form I have shown balls or spheres 6, of carbon or other suitable material, suspended by the threads 7 from the plaque. The plaque itself is also suspended in a manner similar to that shown

in Fig. 1, so as to be free to vibrate, and in some instances I have found it desirable, especially when the plaque is of light material, to attach to the bottom portion thereof a weight *w*, which serves to give it more steadiness in vibrating and render it less subject to disturbing air-currents.

The electrodes are included in two primary circuits or two branches of the primary of the induction-coil 15, one of the primary circuits, as 16, including the bar and blocks on one side of the plate and the other primary 17 including the bar and blocks upon the other side of the plate. These two primaries are wound in the coil 15 about the single secondary wire 18, so that the said secondary is influenced equally by each of the primary circuits. These primary circuits are wound in such a direction that the currents passing through them normally counteract each other in their effect upon the core of the secondary coil 15, tending to hold it in a neutral state. When the suspended plate is vibrated under the influence of sound-waves, the contact-pressure between the blocks and bar upon one side of the plate is caused to increase, allowing more current to flow through the primary circuit connected with such electrodes, and at the same time the contact-pressure between the blocks and bar upon the other side of the plate is decreased, so that less current flows through the primary connected therewith, while the amount of current from the battery is practically constant, the increase through one primary being balanced by the decrease through the other. The variation of current flowing through each of the primaries tends in the usual manner to produce an induced current in the secondary or line wire 18, and as the coils are wound, as before set forth, the effects of these opposite variations in the contact-pressure between the sets of electrodes carried by the plate are united and tend to induce a current in the same direction in the secondary, so that practically double the effect of the variation in the currents in the primary of one set of electrodes is produced in said secondary. In this way comparatively slight variations in the contact between the electrodes will produce increased variation in the current flowing through the secondary, and I am enabled, therefore, to produce better effects from very slight disturbances of the contacts. It will be seen that by this arrangement the primary circuit is constantly closed, even when there is extreme disturbance of the plate from forcible air-vibrations upon the same, for even if one set of contacts is separated under the

impact of sound-waves the other set must remain in contact and the danger from sparking and consequent burning of the electrode is avoided, as the current always finds one passage open through which it can flow under all circumstances. By the use of the freely-suspended plate I have found that comparatively large plates may be used, so that very slight variations in the air-vibrations will effect the same, and I am therefore enabled to transmit accurately both very feeble as well as strong tones.

It will be seen that the above construction is exceedingly cheap and simple and that no inclosing case is required, it being only necessary to suspend the plate in any convenient position within reach of the air-waves produced by the person speaking, and the operative parts of the telephone being exposed, if any adjustment is required it can be made without difficulty.

It will also be evident to those skilled in the art that certain features of my invention may be used separately and in the combination shown, as well as in other combinations of equivalent devices.

Having thus described my invention, what I claim is—

1. In a telephone, the combination of a plate, blocks of conducting material secured on each side of said plate, bars of conducting material resting thereon, rings of rubber surrounding each bar, and a thread or cord connected to said rings and securing said bars in position upon the blocks, substantially as described.

2. In a telephone, the combination of a suspended plate free to move bodily, blocks of conducting material secured to each side of said plate, a bar of conducting material resting by gravity on each set of blocks, and an elastic adjusting-cord passing over said bar, substantially as described.

3. The combination, with a plate, of blocks of conducting material secured on each side of the plate, a bar of conducting material resting on each set of blocks, and a thread or cord connecting said bars, the said thread being at right angles to the plate, substantially as described.

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

EDWARD G. ACHESON.

Witnesses:

F. L. FREEMAN,
J. S. BARKER.