(No Model.)

Z. E. PATRICK.

TELEPHONE TRANSMITTER.

No. 543,313. Patented July 23, 1895.

Fig. 1.

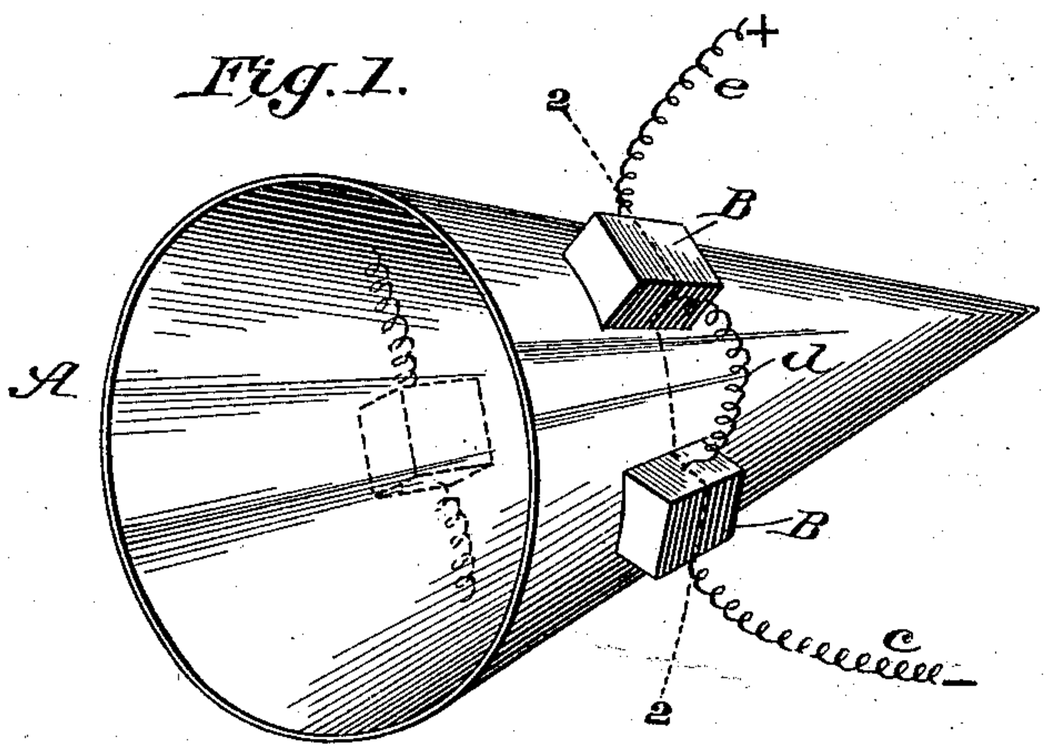


Fig. 2.

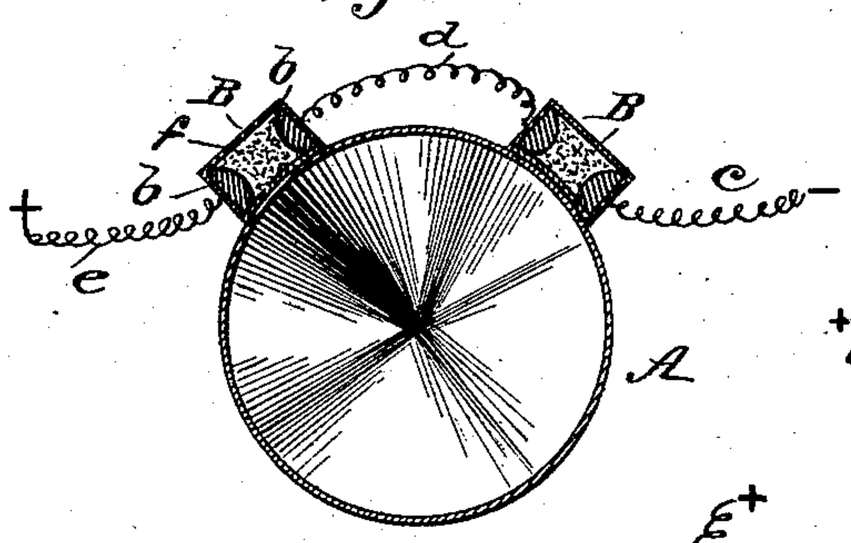


Fig. 3.

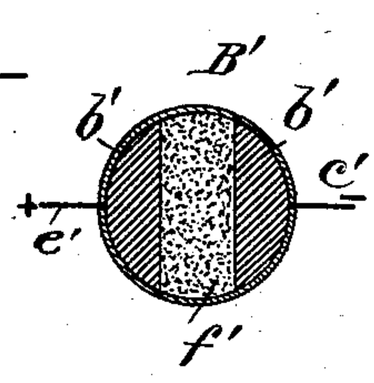


Fig. 4.

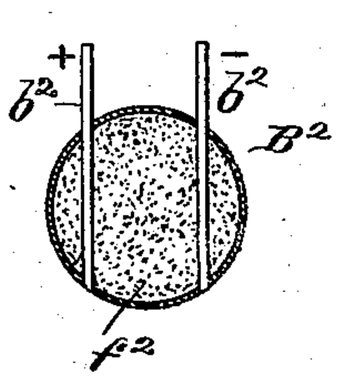


Fig. 6.

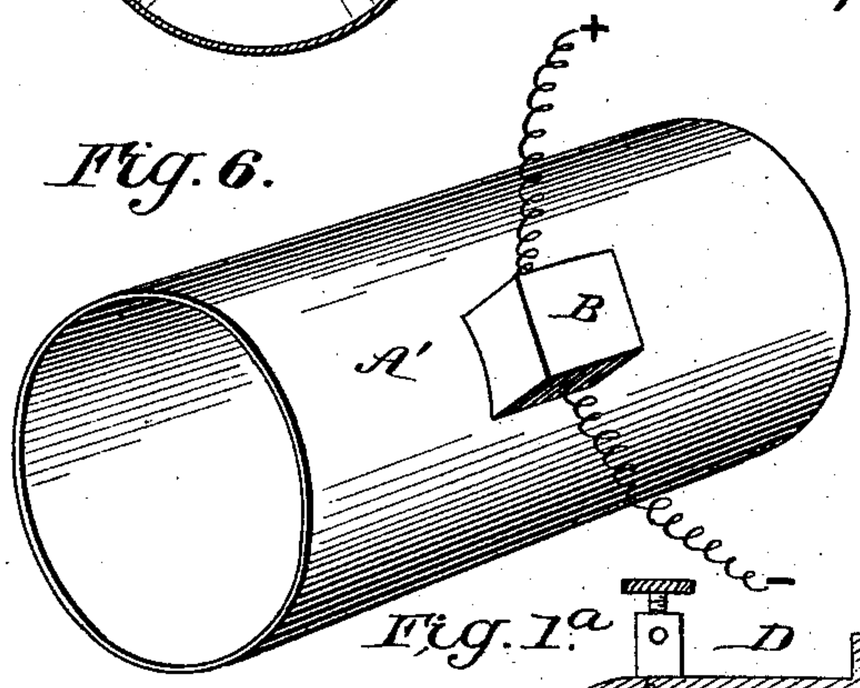


Fig. 5.

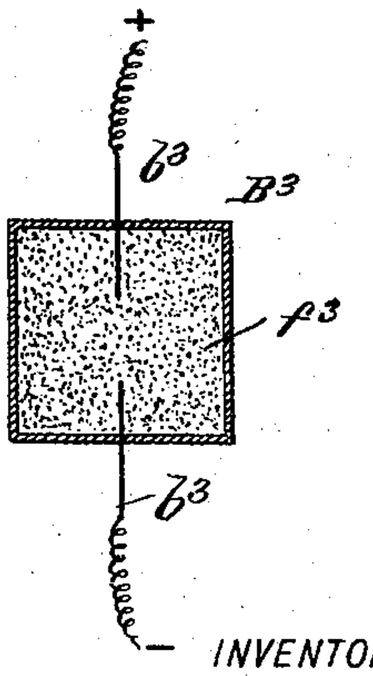
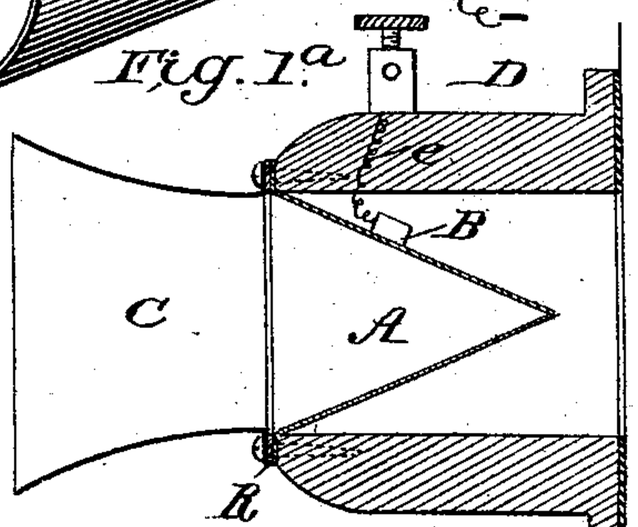


Fig. 1a.



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ZORAH E. PATRICK, OF CHICAGO, ILLINOIS.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 543,313, dated July 23, 1895.

Application filed January 18, 1895. Serial No. 535,412. (No model.)

To all whom it may concern:

Be it known that I, ZORAH E. PATRICK, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Telephone-Transmitters, of which the following is a specification.

My invention is in the nature of a new telephone-transmitter of extreme sensitiveness, loudness, and clearness in the transmission of articulate speech, being especially free from all huskiness in the words, and also so constructed as to be free from liability to derangement or depreciation. It consists in the combination of two old features, one of which is a body of variable resistance, such as a mass of carbon powder contained between two electrodes, and the other of which is a hollow vibratory body preferably in cone shape and of material which is electrically non-conductive, the body of variable resistance being mounted on the hollow vibratory support on its sides in such a way as to permit said hollow body to transmit to the body of variable resistance only those vibrations of electrical value, and suppressing or preventing by its peculiar trussed or braced shape all those mechanical vibrations of excessive range or amplitude of movement which would interfere with the electrical transmission, as will be hereinafter fully described.

Figure 1 is a perspective view of the simplest form of my invention. Fig. 1ª is a sectional view showing it in connection with a mouth-piece and a supporting-frame. Fig. 2 is a cross-section of Fig. 1 on the line 2 2. Figs. 3, 4, and 5 are sectional details showing modifications of the carbon-filled box which forms the body of variable resistance, and Fig. 6 is a perspective view of a modification of the invention in which a cylinder is used instead of a cone.

In the drawings, A represents a hollow cone made of thin pasteboard, papier-maché, or other material capable of vibration from the impact of sound-waves.

B are boxes of electrically non-conductive material mounted upon the sides of the cone and rigidly attached to it by glue or otherwise. These boxes have a filling *f* of pulverized carbon arranged between two electrodes *b b* of carbon or metal, which latter are connected to the circuit-wires *c c*. These boxes may be used singly, as in Fig. 6, or they may be used in pairs, as in Fig. 1, connected by a wire *d*, and they may be indefinitely multiplied and arranged either in series, as in Fig. 1, or each box may have its individual battery connection, as in Fig. 6.

In making use of my invention, I do not confine myself to any particular form or construction of the box B carrying the medium of variable resistance, nor the shape of the electrodes therein. Thus, for instance, the box may be cylindrical in form, as in Figs. 3 and 4, and the electrodes may be segments of a circle, as at *b'* in Fig. 3, or be simple stems, as at b^2 in Fig. 4. The box may also be square, as shown in Fig. 5, and the electrodes be simple flat plates b^3 or extensions of the wire.

In supporting the cone I may arrange it either from a suspended support or fasten it against a wall, as shown in Fig. 1ª. In the latter case the cone A will be surrounded by a case D, carrying binding-posts, with which the wires from the box B connect, and the cone is at its front edge flanged and fastened to the case by a ring R with screws. A mouth-piece C is also by the same ring secured in front of the cone.

While the cone A is the preferred form of support for the body of variable resistance, I may in some cases use a cylinder A', as in Fig. 6, for this purpose. In both cases, however, the body of variable resistance is placed on the side wall of its support and the electrical vibrations are taken off practically at right angles to the direction of the transmission of the sound-waves. In my invention the cone, cylinder, or hollow support is not employed for the purpose of gathering or collecting sound-waves, but is employed by reason of the fact that the transverse arch braces the hollow body against excessive vibration and breaks up or suppresses those excessive mechanical vibrations which not only have no value for electrical transmission but absolutely interfere with the clearness of the transmission. This is accomplished in a remarkable degree by the cone, for the bracing effect of its arched form is further supplemented by the stiffening or trussing effect of the taper of the sides of the cone, so that

there are no chattering vibrations of large amplitude in the cone, but only those are permitted which are of value for electrical transmission, which gives a very clear, strong, and distinct transmission of articulate sounds.

I am aware of the fact that both a cone and a cylinder made of metal and capable of magnetic induction have been placed within a wire helix and used as a telephone-transmitter to receive the vibrations, as shown in Patent No. 252,256. In this case, however, the cone is divided longitudinally and is necessarily of metal and acts by induction, and being slotted longitudinally has none of the braced structure and special mechanical or acoustic value for which my cone is solely employed. I am also aware of the patent, No. 318,907, in which an outer shell and an inner shell, both of metal, have a filling between them of variable-resistance material, the two metal shells being made a conductive part of the circuit. In my invention the cone is not a part of the circuit, is not necessarily made of metal, and is used only for the purpose of supporting on its sides the box of variable resistance in such a way as to allow only certain mechanical vibrations to be imparted thereto, and for this purpose the boxes of variable resistance material are located rigidly on the side walls of the cone or hollow support, so that they get a vibration practically at right angles to the direction of transmission of sound-waves, and as the cone is not used as a funnel for gathering the sound-waves said box of variable resistance may be placed on the inside of the side walls, as shown in dotted lines in Fig. 1, with nearly if not equal advantage.

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

1. A telephone transmitter, consisting of a hollow vibratory shell, a body of variable resistance mounted rigidly upon the side walls of said shells, and an electric circuit passing through the body of variable resistance, the said shell serving to support the body of variable resistance, and transmit modified mechanical vibrations thereto, but being wholly without the electric circuit substantially as and for the purpose described.

2. A telephone transmitter, consisting of a hollow conical shell, a body of variable resistance mounted rigidly upon the side walls of the cone, and an electric circuit passing through the body of variable resistance, the said cone serving to support the body of variable resistance and transmit modified mechanical vibrations thereto, but being wholly without the electric circuit substantially as and for the purpose described.

3. A telephone transmitter, consisting of a hollow conical shell, a box containing electrodes and an interposed body of variable resistance mounted rigidly upon the side walls of the cone, and an electric circuit passing through the electrodes and body of variable resistance, the said cone serving to support the body of variable resistance and transmit modified mechanical vibrations thereto, but being wholly without the electric circuit substantially as and for the purpose described.

4. A telephone transmitter, consisting of the combination with an inclosing case; of a conical shell having its base fastened to the front of the case, a body of variable resistance fixed rigidly upon the side wall of the conical shell and within the inclosing case, and an electrical circuit passing through the body of variable resistance substantially as and for the purpose described.

5. A telephone transmitter, consisting of the combination with an inclosing case; of a conical shell having its base fastened to the front of the case, a body of variable resistance fixed rigidly upon the side wall of the conical shell and within the inclosing case, an electrical circuit passing through the body of variable resistance, a flanged mouth piece arranged in front of the conical shell, and a ring with clamp screws passing through and securing both the mouth piece and conical shell to the case substantially as and for the purpose described.

The above specification of my invention signed by me, this 16th day of January, A. D. 1895, in the presence of two subscribing witnesses.

ZORAH E. PATRICK.

Witnesses:
HERMAN W. SNOW,
EDWD. W. BYRN.