(No Model.)

E. A. BALLOCH.

RESONANT ATTACHMENT FOR TELEPHONES.

No. 370,847. Patented Oct. 4, 1887.

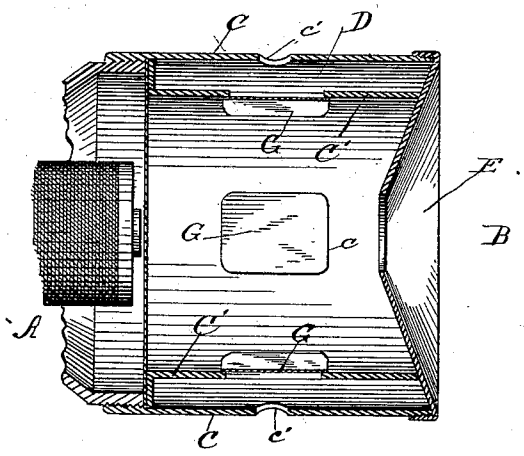


Fig. 1.

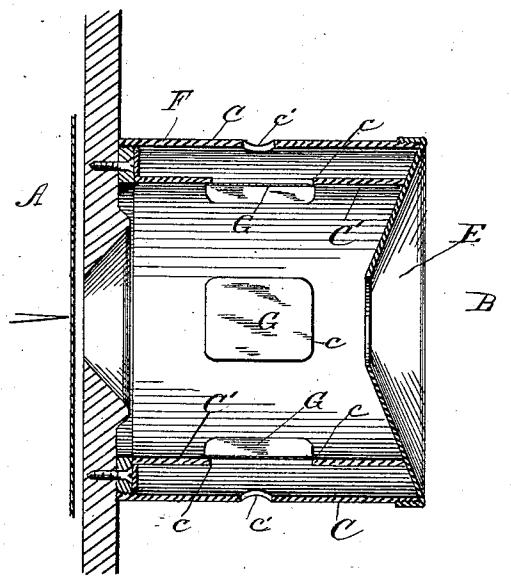


Fig. 2

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UNITED STATES PATENT OFFICE.

EDWARD A. BALLOCH, OF WASHINGTON, DISTRICT OF COLUMBIA.

RESONANT ATTACHMENT FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 370,847, dated October 4, 1887.

Application filed June 7, 1887. Serial No. 240,541. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. BALLOCH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Resonant Attachments for Telephones; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to resonant attachments for telephonic transmitters or receivers; and it consists of the peculiar combination and arrangement of parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

The object of my invention is to provide a telephone with means for amplifying the sound-waves before they strike the diaphragm of the transmitter, and after their emission from the diaphragm of the receiver, with a view of transmitting conversation with more distinctness and clearness.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my invention applied to a telephone-receiver. Fig. 2 is a sectional view on the line *x x* of Fig. 1, showing the resonant box applied to the transmitter.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A indicates an ordinary telephonic transmitter or receiver, and B my improved resonant box, which is secured to the case of the instrument. When the resonant box is applied to the receiver, the cap thereof is removed and the resonant box secured to the open side of the instrument in any preferred way; but when it is secured to the transmitter the cap may remain attached to the case, as in Fig. 2.

The resonant box B of my invention comprises an inner and outer shell, C C′, which are of different diameters and are arranged concentrically one within the other, as shown. These shells are arranged out of contact with each other to provide a space or chamber, D, between the shells, and the ends of this air chamber or space are closed in the manner presently explained. The outer end of the resonant box and the corresponding end of the air-chamber between the shells thereof are closed by an ordinary cap, E, which has the usual central opening, and is secured to the outer shell of the box, as shown. The rear end of the air-chamber D is closed by means of an annulus or ring, F, which is arranged between the two shells C C′, and firmly unites the same together to maintain the relative positions of the shells, the annulus bearing against the edges of the diaphragm of the receiver, as in Fig. 1, and against the cap in the transmitter, as in Fig. 2.

The two shells which form the resonant box B may be of any shape; but I prefer to make them cylindrical, for the reason that the air-chamber D is of uniform diameter when the shells are of that form.

The inner cylindrical shell, C′, of the resonant box is provided with a series of openings or fenestræ, which are located at suitable intervals from one another, about midway of the length of the shell; and these openings or fenestræ are covered by resonant diaphragms G of a vibratory nature, preferably made of gold-beater's skin, which is very thin and tenacious. These resonant diaphragms are stretched taut and securely connected to the inner shell over the fenestræ therein, and the said diaphragms are free to vibrate when the sound-waves impinge thereon, and thereby reflect and amplify the sound-waves in the resonant box, which tends to materially increase the efficiency of the instrument, as the conversation can be heard with much greater clearness and distinctness.

The outer shell of the resonant box is provided about midway of its length with a series of air-openings, *c′*, which are arranged opposite to the fenestræ in the inner shell, these air-apertures being of considerably smaller size or diameter than the fenestræ. By means of the openings in the outer shell opposite to the resonant stretched diaphragms the sensitiveness and efficiency of the latter are very materially increased, as the air in the chamber D is free to pass through the openings in the outer shell when the resonant diaphragms are vibrated by the sound-waves.

The operation of my invention is obvious from the foregoing description, taken in connection with the drawings.

Without confining myself to the exact form and proportion of parts herein shown and described as an embodiment of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A resonant box adapted to be applied to an ordinary telephonic transmitter or receiver, comprising an outer shell, an inner shell having one or more openings therein, and a resonant diaphragm covering the opening in the inner shell, substantially as described, for the purpose set forth.

2. A resonant box adapted to be applied to telephonic receivers or transmitters, comprising two concentric shells arranged out of contact with one another and forming an intermediate air-chamber, the inner shell having one or more openings or fenestræ, and a resonant diaphragm covering the opening in the inner shell, substantially as described.

3. A resonant box adapted to be applied to a telephonic receiver or transmitter, comprising two concentric shells arranged to form an intermediate air-chamber, and each having a series of openings formed at an intermediate point of their length, and resonant taut diaphragms secured to the inner shell over the openings therein, substantially as described.

4. A resonant box adapted to be secured to an ordinary telephonic receiver or transmitter, comprising two concentric shells arranged one within the other to form an intermediate air-chamber, the ends of which are closed, each shell having a series of openings in line with the openings of the other shell, and resonant diaphragms applied to the inner shell over the openings therein, substantially as described.

5. The combination, with a telephonic receiver or transmitter, of a resonant box secured thereto and having an inner and outer shell, perforated as described, and resonant diaphragms secured to the inner shell over the openings therein, as set forth.

In testimony whereof I affix my signature in presence of three witnesses.

EDWARD A. BALLOCH.

Witnesses:
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