(No Model.)

C. F. SCATTERGOOD.

TELEPHONE TRANSMITTER.

No. 498,309. Patented May 30, 1893.

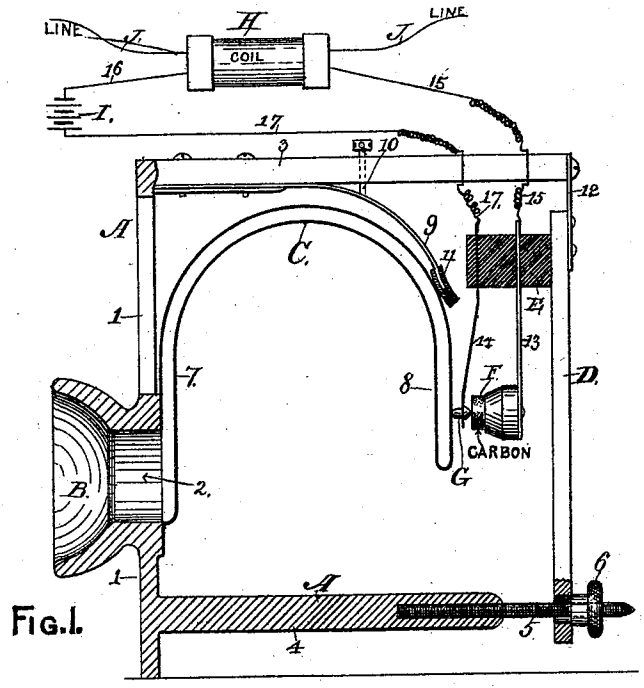

Fig. 1.

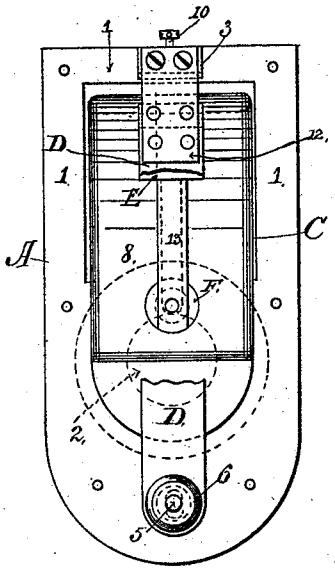

Fig. 2.

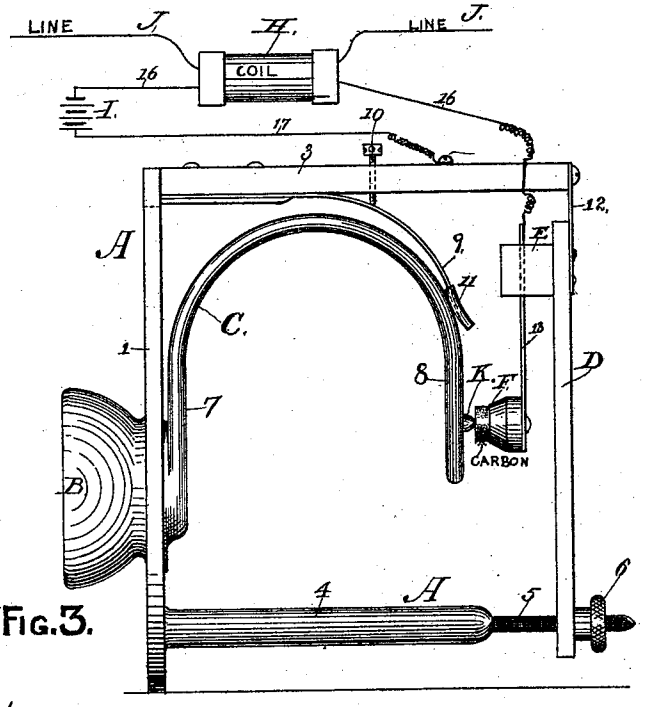

Fig. 3.

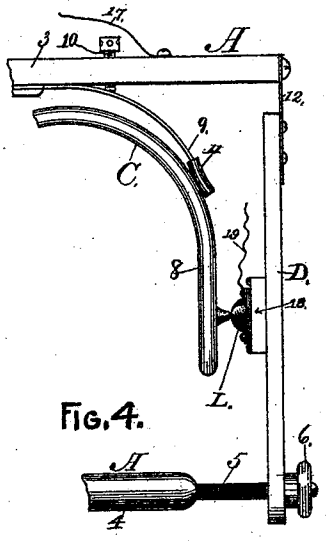

Fig. 4.

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TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 498,309, dated May 30, 1893.

Application filed December 14, 1892. Serial No. 455,166. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SCATTERGOOD, of the city and county of Albany, in the State of New York, have invented new and useful Improvements in Telephone-Transmitters, of which the following is a full and exact description.

My invention relates to improvements in telephone transmitters for electrically transmitting audible speech and other sounds; and it consists of the novel construction and combination of parts herein described, shown in the accompanying drawings, and specifically pointed out in the claims.

Heretofore a diaphragm or disk has been employed in the construction of telephone transmitters for the purpose of being set in vibratory action by the varying pressures exerted by the sound-waves thereon in the electrical transmission of sound, but in my improvement such diaphragm is dispensed with and a highly sensitive flat-tubular spring is arranged to communicate with the mouth-piece of the instrument in such manner that the sound-waves of different intensities will enter the interior of the spring and produce the required vibratory action of the latter to effect the transmission of sound.

In the accompanying drawings, which are herein referred to and form a part of this specification, Figure 1 is a vertical longitudinal section of the operative parts of my transmitter detached from their inclosing case, a portion of said parts being shown in side elevation. Fig. 2 is an end elevation of the same, a portion of the adjusting-bar being broken out to expose hidden parts, and the induction-coil and conducting-wires being omitted therefrom. Fig. 3 is a side elevation of operative parts of a modified form of my invention detached from their inclosing case; and Fig. 4 is a side elevation of part of another modification of my invention.

As represented in the drawings, A designates the metallic frame of my transmitter, which consists of a vertical arm, 1, provided with an opening, 2, an upper horizontal arm, 3, and a lower horizontal arm, 4, provided with a screw, 5, on which an adjusting-nut, 6, is fitted to run.

B designates a mouth-piece, which may be integral with the metallic frame of the instrument, or it may be a separate piece, but in either case the opening of said mouth-piece should have a free communication with the opening 2 of the frame A, so that speech or other sounds can enter said opening through the mouth piece.

C designates a metallic spring made in the form of a flat tube that is bent into an inverted U-shape so that its vertical limbs will be practically parallel with each other. The limb 7 of said spring is attached to the inner side of the arm 1 of frame A in such manner that the opening 2 will communicate directly with the interior of said spring, so that the sound-waves produced by speaking, or other noises, will enter the interior of said tubular-spring and produce a vibratory action of the latter in correspondence with the force exerted by said waves which, when exerted inside of a bent tube, tends to straighten out said tube. Both extremities of said tubular-spring are closed for the purpose of obtaining the best vibratory action of said spring by the variable pressures of the sound-waves. Both limbs of the spring C are preferably arranged in pendent position with the limb 8 left free to vibrate according to circumstances. To obtain a steadiness in the vibratory action and prevent a tremulous movement of the spring C, a spring-damper, 9, is fitted to bear upon the arch of said spring near the limb 8, and an adjusting-screw, 10, is arranged to increase and diminish the pressure of said damper upon the spring C as occasion may require; an elastic cushion, 11, of rubber or other suitable material is attached to the free end of the damper spring to prevent a rattling sound from contact of the two metallic parts.

D designates an adjusting-bar that is attached by a yielding connection, 12, to the arm 3 of the frame. The opposite end of said bar is fitted to receive the screw 5 which passes through the bar, so that the adjusting-nut 6 will be at the outer side of said adjusting-bar in such manner that said nut and screw can be utilized for swinging the adjusting-bar D toward the spring C. The resilience of the connection 12 will effect the movement of the adjusting-bar D in an opposite direction whenever the nut 6 is slackened off to allow such movement to be made.

In the construction shown in Figs. 1 and 2, a block, E, of hard rubber or other insulating material is attached to the adjusting-bar D, and a spring, 13, is held in said block. To the free end of said spring is attached a contact-point, F, of carbon or other suitable material. A supplementary spring, 14, is also secured in said block so as to be interposed between the spring 13 and the tubular-spring C. The free end of the spring 14 is provided with a contact-point, G, which is arranged to bear simultaneously against the limb S, of the tubular-spring C, and the contact-point F. The fixed end of the springs 13 and 14 is securely held in the insulating-block E, and the spring 14 should be made of a very delicate and sensitive metallic leaf.

H designates an induction-coil, which may be located at any convenient point, either inside or outside of the case in which the operative parts of the instrument are inclosed. One end of said coil is connected, by a conducting-wire, 15, to the fixed end of the spring 13. The opposite end of said coil is connected, by a conducting-wire, 16, to one pole of an electric-battery, I, whose opposite pole is connected, by a conducting-wire, 17, to the fixed end of the spring 14. The line-wire J is involved by the induction-coil H in such manner that said line-wire will be electrically excited by the coil.

The modified construction shown in Fig. 3 differs from the one above described by omitting the supplementary spring 14, above referred to, connecting the conducting-wire 17 directly to the metallic frame A, and providing the free limb of the tubular-spring C with a contact-point, K, that is arranged to take against the contact-point F.

The construction shown in Fig. 4 differs from the one shown in Fig. 3 by omitting the spring 13, attaching an insulating-block, 18, to the adjusting-bar D, and securing a contact-point, L, to said insulating-block, so that said contact-point will be electrically insulated from the adjusting-bar. The contact-point L is connected, by a conducting-wire, 19, to an electric-battery similar to the arrangement shown in Fig. 3.

In both of the modified constructions last described the metallic-frame A is utilized for the purpose of conducting the electrical current through the tubular-spring C and its attached contact-point.

By means of the adjusting-nut 6 the adjusting-bar D can be adjusted to bring the tubular-spring C into a required condition of contact with the contact-points in either of the different constructions of the instrument, said adjustment being susceptible of the most infinitesimal variation to effect any slight difference in pressure between the contacting points.

When sound enters through the opening 2 and passes into the interior of the tubular-spring C the sound waves will increase the internal pressure and tend to straighten the curvature of said spring and thereby the contact pressure of the electrodes will be correspondingly increased, but a succeeding diminution of the pressure within said spring will produce a quickening of the curvature of said spring; by this alternation of the degrees of pressure within the tubular-spring a vibratory motion is imparted to the latter that will produce a constantly-varying pressure between the electrodes and the pulsatory effects of said electrodes will be conveyed to the receiving instrument.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A telephone-transmitter consisting of a U-shaped flat-tubular spring having one extremity held in a fixed position with the interior of said spring open to the atmosphere; the opposite extremity being closed and left free to vibrate, an electrode arranged to bear against the vibratile portion of the spring, and an electric circuit connected with said electrode, substantially as herein specified.

2. In a telephone-transmitter, the combination of a U-shaped flat-tubular spring having one extremity held in a fixed position with the interior of said spring having a free communication with the atmosphere; the opposite extremity of the spring being closed and left free to vibrate, an electrode in electrical communication with an electric circuit, and a damper arranged to bear against said spring, substantially as herein specified.

3. In a telephone-transmitter, the combination of a U-shaped flat-tubular spring having one extremity held in an immovable position and provided with an opening which forms a free communication between the interior of the spring and the atmosphere; the opposite extremity of said spring being closed but left free to vibrate, and an electrode in electrical communication with an electric circuit and arranged to bear against the vibratile portion of said spring; said electrode being adjustable in respect to said spring, substantially as herein specified.

4. In a telephone-transmitter, the combination of a U-shaped flat-tubular spring arranged to receive sound in its interior, and an electrode electrically connected with an electric circuit and arranged to bear against the vibratile portion of said spring; said electrode being attached to an adjusting-bar which is adjustable in respect to the said spring, substantially as herein specified.

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