(No Model.)

C. W. LONG.

TELEPHONE TRANSMITTER.

No. 306,026. Patented Sept. 30, 1884.

Fig. 2.

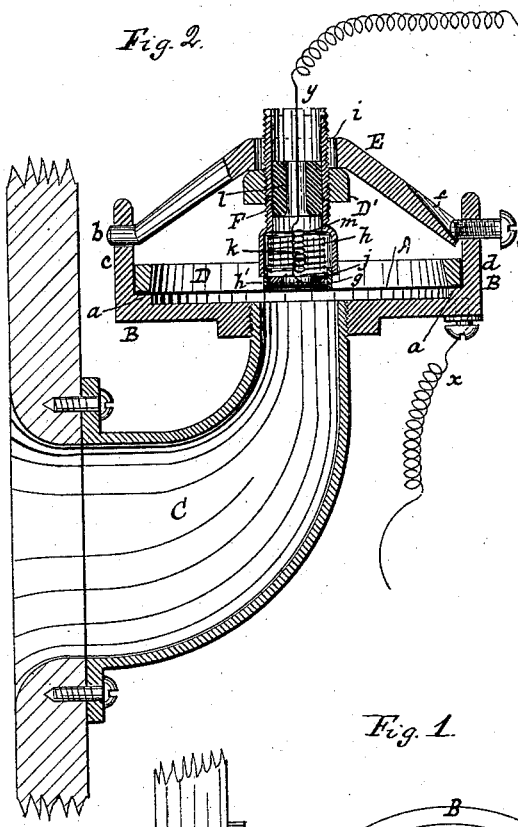


Fig. 3.

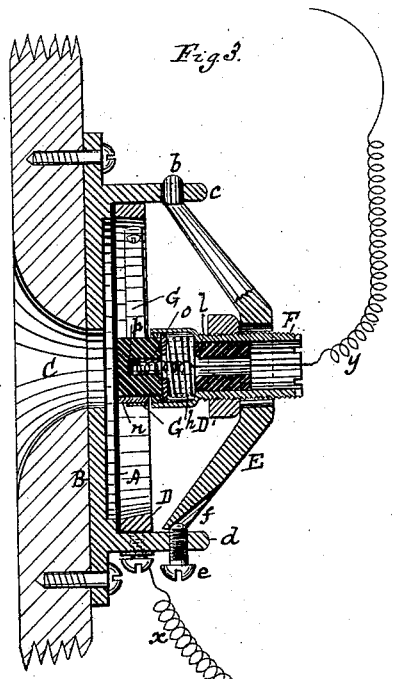
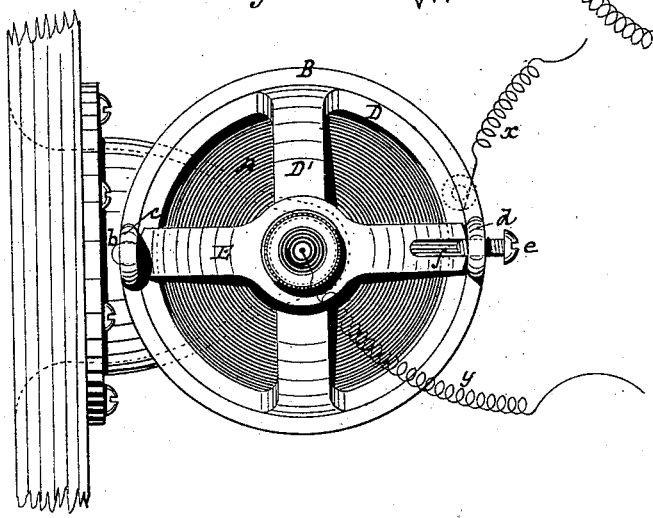


Fig. 1.



WITNESSES

Ewell A. Fitch

J. Walter Blandford

INVENTOR

Charles W. Long

by Marcellus Bailey

his ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES W. LONG, OF LOUISVILLE, KENTUCKY.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 306,026, dated September 30, 1884.

Application filed June 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. LONG, of Louisville, Kentucky, have invented a certain new and useful Improvement in Telephone-Transmitters, of which the following is a specification.

My invention has relation to telephone-transmitters, and is directed to obtaining a simple and efficient form of such instrument which can be easily and accurately adjusted. To this end I combine with the diaphragm the button, which makes contact therewith, and a conductor electrically connected with the button, and consisting, for a portion of its length within the transmitter, of a spiral coil, an independent insulated spring which bears upon the contact-button, and means whereby the pressure exercised by said spring upon the button can be varied at will.

I am aware that it is not new, broadly, to give the conducting-wire that carries the contact-button the form of a spiral coil, this being for the purpose of providing a way by which the pressure of the button on the diaphragm can be varied. In my case, however, the coiled spring by which the pressure is obtained is an independent spring not in the circuit. It is this spring which determines the pressure for the great part, if not entirely. The coiled portion of the circuit-wire, while it may exercise to a certain extent pressure ancillary to that exerted by the main spring, is, however, made light and thin, its principal function being to allow the button to respond freely to the vibrations of the diaphragm.

The nature of my improvement and the manner in which the same can be carried into practical effect will be understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical central section, and Fig. 2 is a plan, of a telephone-transmitter embodying my invention. Fig. 3 is a vertical central section of a modification hereinafter described.

In the transmitter shown in Figs. 1 and 2 the diaphragm A is horizontal. This diaphragm is of the usual kind, being made of some conducting material, and electrically connected with the circuit-wire *x*.

B is the case of the transmitter, and C the voice-opening. The diaphragm rests on an annular shoulder, *a*, in the case, and is held down by a clamping-ring, D, provided with a central bow, D′. The ring is held down with clamping pressure on the diaphragm by a bridge-piece, E, which spans the case B at right angles to the bow D′, and rests on the central part of the latter. One end, *b*, of the bridge-piece enters a hole in an ear, *c*, on one side of the transmitter. On the opposite side of the transmitter is another ear, *d*, through which passes a clamping-screw, *e*, whose inner end bears upon the inclined upper face of the other end, *f*, of the bridge-piece. By advancing the clamping-screw it will act to force down the bridge-piece upon the bow D′, and thus to clamp the ring D upon the diaphragm. This, which is one convenient way of clamping the diaphragm, is not of my invention. Other means for the purpose can, if desired, be employed. The contact-button *g*—usually of carbon—is surrounded by a ring, *h*′, of non-conducting material, attached to the diaphragm, and is held against the button by a spring, *h*, whose pressure is regulated by a screw-thimble, F, which passes through an opening, *i*, in the bridge-piece E, and screws into and through a hole in the bow D′, which thus forms a bearing for the thimble. The thimble at its inner and lower end is enlarged, so as to encircle and inclose the spring *h*. The latter is confined between a shoulder on the thimble above and the button *g* below, a disk, *j*, of non-conducting material, being interposed between the spring and the button. To the button is electrically connected the conducting-wire *y*, which for a portion of its length is coiled, as shown at *k*, this coiled portion being usually made of thin platina wire. The wire passes out from the transmitter through a tubular non-conducting plug, *l*, inserted in the thimble F.

I prefer to place above the spring *h* a thin non-conducting disk, *m*, through which the conductor *y* passes. This disk rests not only on top of the outer spring, *h*, but also on the coil *k*, so that by advancing the thimble both coils will be compressed. The circuit is made through *x*, the diaphragm A, button *g*, and thence to line through wire *k y*.

In the modification shown in Fig. 3 the arrangement is similar in a general way to that shown in Figs. 1 and 2, and the lettered parts in

this figure correspond to like lettered parts in the preceding figures. The diaphragm, however, is vertical instead of horizontal, and the carbon contact-button is thicker than in Fig. 1. To sustain the button in proper position with respect to the vertical diaphragm, I make use of a bent arm, G, attached to the ring D, and extending down and under the button, forming a cradle in which the latter can rest. Between the cradle part of the arm and the button is interposed non-conducting material *n*. In this figure the conducting-wire *y* is represented as both electrically connected and mechanically united to the carbon button. I accomplish this result easily and effectively by means of a conducting amalgam—for example, an amalgam of mercury and a good conducting metal—or any good conducting metal alone. The inner end of the conducting-wire is inserted in a hole or socket, *o*, in the carbon button, and then this hole is partly filled with the amalgam, as represented at *p*, which is tamped around the wire, so as to hold it tight to the button. The amalgam hardens and permanently unites the two mechanically, and electrically as well.

Having described my improvement and the best way known to me of carrying the same into effect, what I claim herein as new and of my own invention is as follows:

1. The combination, with the diaphragm and the contact-button, of the spirally-coiled conducting-wire electrically and mechanically connected to the button, the independent insulated spring which holds the button against the diaphragm, and the thimble for holding the spring and button, substantially as hereinbefore set forth.

2. The combination of the diaphragm, the contact-button, the spirally-coiled conducting-wire electrically and mechanically connected to the button, the independent insulated spring for holding the button against the diaphragm, the thimble for holding the spring and button, and means, substantially as described, for varying the pressure of the spring.

In testimony whereof I have hereunto set my hand this 13th day of June, 1884.

CHAS. W. LONG.

Witnesses:

EWELL A. DICK,

J. WALTER BLANDFORD.