F. A. GOWER.
Telephone-Signal.

No. 220,826. Patented Oct. 21, 1879.

Fig. 1.

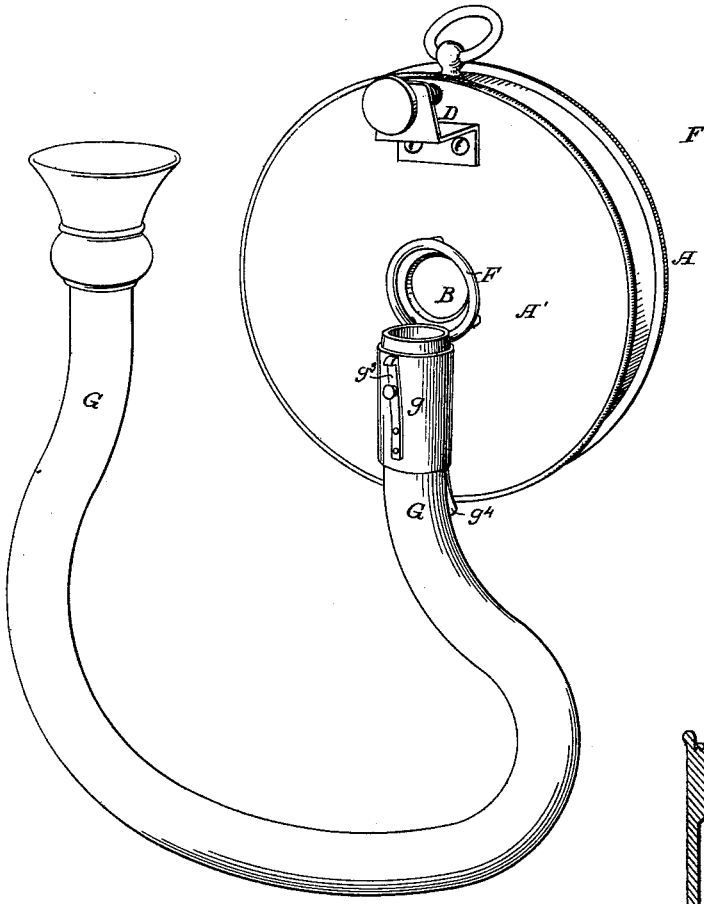


Fig. 2.

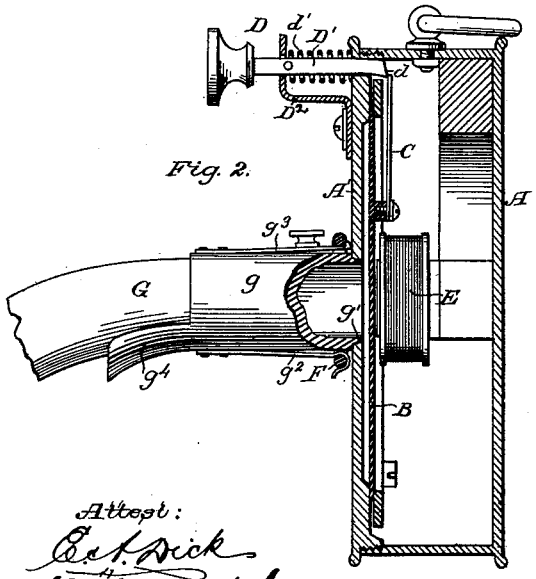
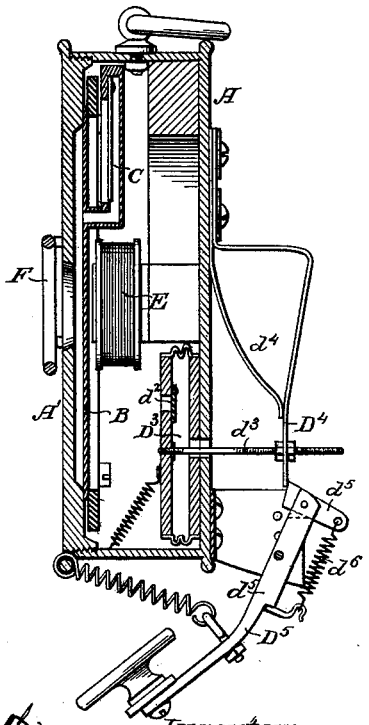


Fig. 3.



Attest:
E. F. Dick
C. J. Hedrick

Inventor:
Frederic A. Gower by
A. Pollok his atty

UNITED STATES PATENT OFFICE.

FREDERIC ALLEN GOWER, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN TELEPHONE-SIGNALS.

Specification forming part of Letters Patent No. **220,826**, dated October 21, 1879; application filed July 10, 1879.

To all whom it may concern:

Be it known that I, FREDERIC ALLEN GOWER, of Providence, Rhode Island, but temporarily residing in Paris, in the Republic of France, have invented new and useful Improvements in Telephone-Signals, which improvements are fully set forth in the following specification.

This invention relates more particularly to the means for signaling or calling the attention of a person at the other end of the telephone-line when it is desired to communicate with him; but it has reference also to devices for attaching a hearing and speaking tube to the telephone.

The signal is commonly given by the aid of a magneto-electric current generated by bobbins revolving in front of the poles of a magnet, or by other suitable mechanism. By a former invention of my own I was enabled to dispense with such mechanism, by combining with the telephone a musical instrument or reed located within the box. The vibrations of this reed being communicated to the diaphragm, a signal sufficiently loud and characteristic to attract attention was given by the telephone at the other end of the line.

The musical instrument or reed was operated by a blast of air blown by the person using the telephone through the mouth-piece or speaking-tube.

In the present invention mechanical means are combined with the box for operating the musical instrument or reed. These means may be somewhat varied, and are suited to the kind of instrument used. When a reed or wind instrument is used, an arrangement of bellows or similar air-forcing mechanism is employed. When the instrument is adapted to be sounded by plucking, striking, or rubbing, devices suitable therefor are used in connection with it.

The reed or musical instrument is preferably attached to the under side of the diaphragm or vibratory plate, and the operating mechanism located within the telephone-box.

In order, in speaking through the telephone, to convey the sound-waves properly to the telephone, or from the telephone to the ear of the listener, a hearing and speaking tube is employed, and this is preferably a flexible tube of suitable length, with a mouth-piece at one end, and rigidly attached at the other by a suitable coupling to the top of the telephone-box. This tube, if allowed to remain attached at all times when not in use, is apt to become worn and break at that point where, by reason of its weight, it bends downward. Moreover, when a musical-instrument signal is employed, on account of the flexure and length of said tube, the sound is partly lost, or not projected directly into the room where the telephone is.

In this invention the devices for attaching the tube to the box are so arranged that when not in use the tube may hang vertically downward, and the opening in the top of the telephone being uncovered, the sound-waves from the vibratory plate or diaphragm are projected, without disturbance or deflection, into the surrounding atmosphere. When it is desired to listen to or send a communication, the tube is easily and quickly secured in position.

The following description will enable those skilled in the art to which it appertains to make and use this invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a front view of a telephone with its speaking and hearing tube made in accordance with said invention; Fig. 2, a view in side elevation, partly in section, showing the interior construction of the telephone shown in Fig. 1; and Fig. 3, a view, in section, of a telephone provided with an arrangement of bellows to operate the musical instrument or reed, in place of the plucking device illustrated in Figs. 1 and 2.

The same letters indicate like parts wherever they occur.

A is the telephone case or box, with its top or face A′ centrally perforated. To this top the vibratory plate or diaphragm B is solidly secured by a ring and screws, and to the diaphragm a musical instrument or reed, C, is attached eccentrically.

D represents the mechanism for operating the musical instrument or reed, and E the magnet, with its poles facing the diaphragm surrounded with coils.

On the top or face A′, but at a slight distance therefrom, a ring, F, is supported, surrounding concentrically the perforation or

opening therein. By means of it the hearing and speaking tube G is attached and held in position over the opening.

As shown in Figs. 1 and 2, the mechanism, D, for operating the musical instrument consists of a plucking-pin, D′, working through a standard or brace, D^2, and the top of the box, and having at its inner end an enlargement, *d*, on one side. When the pin is depressed by a button or other suitable means, the enlarged end *d* forces the reed downward, and then suddenly releases it, allowing it to vibrate. The side of the pin, being cut away above the enlargement, is not in contact with the end of the reed, which vibrates freely. A spring, *d*′, returns the pin to its first position when the button is released.

The reed C may be quite thick and heavy, so as to impart great vibration to the diaphragm.

Instead of using a plucking device, as shown, a hammer forced against the reed directly, or by the release of a compressed spring or one under tension, may be employed.

Instead of a straight reed, a triangle, tuning-fork, a coiled spring, or other instrument may be attached to the diaphragm, and operated by devices indicated, or other sounding means of suitable or ordinary construction.

In Fig. 3 the operating mechanism is a bellows, D^3, or similar air-forcing mechanism. This is shown arranged to draw the air through a hole in the diaphragm, and through the musical instrument C, attached over the aperture. The reed of the instrument is vibrated by the current of air, and it is preferably secured so that its free end projects toward the center of the diaphragm.

The bellows is secured to the back of the telephone-box, the movable board provided with the inwardly-opening valve d^2 being operated by means of a pin, d^3, attached thereto, and passing through the fixed board and back of the box. The outer end of the pin is passed through an arm, D^4, and kept in position by nuts on both sides thereof. The arm is retained in an elevated position by a spring, d^4, and its own elasticity. To depress this arm to open the bellows, a lever, D^5, pivoted in a standard on the box, is employed. The arm, when depressed, is released by the end of the lever D^5 slipping off of it, and allowed to spring back suddenly, so as to cause a quick, sharp sounding of the reed or musical instrument. In order to allow the lever to be easily returned for another blast of the bellows, a pivoted piece, d^5, with a spring, d^6, is provided at its end. This spring yields, and allows the piece d^5 to turn, so as to easily pass by the end of the arm D^4. A retractile spring returns the lever D^5 to its first position when it is released by the operator.

The bellows, when closed by the arm D^4, creates a vacuum in the box beneath the diaphragm, and the exterior air, rushing through the opening therein, sounds the reed or musical instrument.

It is evident that the bellows might be made to force air into the box, the reed being suitably arranged, if desired, and also that other means for working the bellows or other air-forcing mechanism, instead of the bellows, might be used. The bellows is, preferably, made of the shape shown, and fitted between the arms of the magnet and the sides of the box.

The devices for attaching and securing the flexible tube G in position are applicable to all the forms of apparatus shown and indicated.

The coupling-piece *g* is cut away at the end, or shouldered, as shown at *g*′, to fit within the opening in the cover of the telephone-box, and on opposite sides thereof are secured strips g^2 g^3, attached by one end. The strip g^2 is bent into the form of a hook at its free end, and the other strip, g^3, forms a spring-catch, the outer end being shouldered and beveled, as shown.

The strip g^2 is hooked over the ring F, and the tube is supported thereby when not in use. To secure the latter in proper position for speaking or listening, the coupling is raised, and the end being placed in the opening in the top of the box, it is held by the spring catch or strip g^3, which engages with the ring F. To release the coupling it is only necessary to force inward the strip g^3, when the tube will be held by the hooked strip g^2 only, as shown in Fig. 1. A curved piece, g^4, attached to the coupling-piece at its inner end, serves to sustain the tube when in use.

The musical instrument, instead of being attached to the vibratory plate or diaphragm of the telephone, may form a part thereof. For example, by making in the diaphragm a hole of peculiar shape, with its edges depressed or lapped upon each other, the diaphragm may be converted into a kind of whistle, for use with suitable air-forcing means.

I have shown the invention applied to what is known as the "chronometer-telephone," the box being round and constructed of metal, (brass,) and the magnet of a peculiar form; but it is not limited thereto, but may be used with telephones of any ordinary or suitable construction. The chronometer-telephone is, however, the most compact, and with it the best effects are produced in signaling.

Having thus fully described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a telephone having a vibratory plate, of a musical instrument or reed connected with said plate, and means, substantially as described, for sounding said instrument or reed mechanically, as set forth.

2. The combination, with the vibratory plate or diaphragm and box of a telephone, of a musical instrument or reed attached to said plate, and mechanism, substantially as described, located within or carried by the box, for sounding said instrument or reed, substantially as set forth.

3. The combination, with the vibratory plate and box of a telephone, of a musical instrument or reed attached to said plate, and a plucking device, substantially as described.

4. The combination, with the box of a telephone, of a ring surrounding the opening in the top of said box, a hearing and speaking tube, and a coupling-piece provided with a spring-catch arranged to retain the tube in position over the opening, by engagement with said ring, substantially as described.

5. A hearing and speaking tube for telephones, having at one end a mouth-piece, and at the other a coupling provided with a hook on one side and a spring-catch on the side opposite thereto, substantially as and for the purpose set forth.

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

FREDERIC ALLEN GOWER.

Witnesses:

S. N. GOTENDORF,

ROBT. M. HOOPER.