W. GILLETT.

Speaking-Telephone.

No. 204,024. Patented May 21, 1878.

Fig. 1.

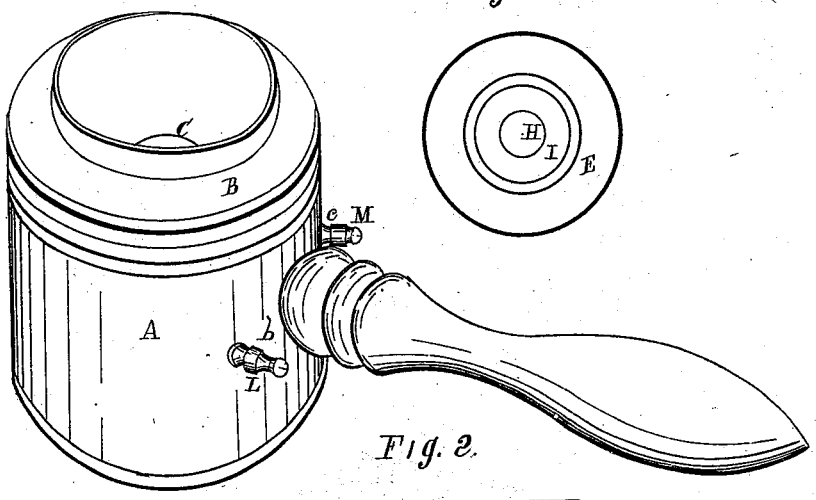
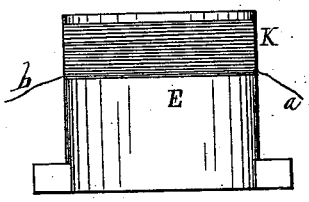


Fig. 3.

Fig. 2.

Fig. 4.



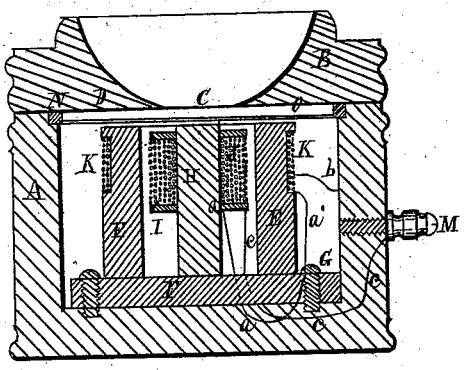
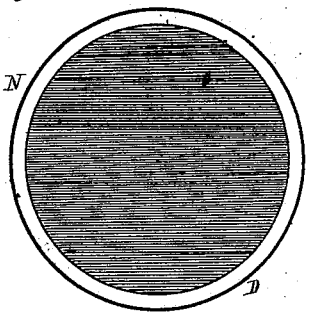


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

WEBSTER GILLETT, OF YPSILANTI, MICHIGAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO C. M. GILLETT, OF CLEVELAND, OHIO.

IMPROVEMENT IN SPEAKING-TELEPHONES.

Specification forming part of Letters Patent No. **204,024**, dated May 21, 1878; application filed March 22, 1878.

To all whom it may concern:

Be it known that I, WEBSTER GILLETT, of Ypsilanti, in the county of Washtenaw and State of Michigan, have invented a certain new and Improved Telephone; and I do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings, making a part of the same.

Figure 1 is a perspective view of the instrument. Fig. 2 is a transverse section. Figs. 3, 4, and 5 are detached sections, which will be hereinafter referred to.

Like letters of reference refer to like parts in the several views.

My invention or improvement in telephones consists of a vibrator or series of wires or springs placed transversely opposite the mouth-piece or opening thereof; and also in the combination of the above with a magnetic cylinder having a coil of wire thereon and inclosing an electro-magnet, which is connected with said cylinder by means of a metallic plate.

The magnetic cylinder is secured at its base to a case or holder, within which is a soft-iron central core or magnet, with a spool thereon of insulated wire. Between the core-spool and cylinder is an annular space, and around the cylinder is wound a coil of insulated wire, the inner end of which is attached to the inner end of the wire upon the spool of the said soft-iron core or magnet, while the outer end extends to one of the binding-posts, and the outer end of the wire or helix on the said spool goes to the other binding-post.

In close proximity to the end of the cylinder and soft-iron magnet is placed a wire vibrator, which is secured to the case in such way as to allow the wires thereof to vibrate to and from the cylinder and magnet. The case in which the cylinder, wires, magnet, spool, and vibrator are inclosed may be of any suitable form, and is provided with a cap having a central opening directly in front of the vibrator.

I am aware that telephones with diaphragms, bar or permanent magnets, and wire coils have been used. Therefore I do not claim them *per se;* but the distinguishing features of my improvement consist in the wire vibrator, cylinder, with its coil, and the soft-iron magnet, with its spool and coil or helix, arranged within the said cylinder and connected with a suitable case in such way that the wires of the vibrator are transverse to the end of the cylinder and magnet, which, in connection with the wire coils on the spool and cylinder, generates an electric influence, which is transmitted over the line from one point to another. This electric energy is generated by means of the vibrator, caused by any acoustic action in the vibratory wires.

For a more full and complete description of the said invention, reference will be had to the following specification and to the annexed drawings, making part of the same.

In Figs. 1 and 2, A represents the case, and B the cap or cover, in which is a central opening, C, in proximity to the vibrator D. Directly on the opposite side of the vibrator is the magnetic cylinder E, which is secured to the inside of the case, and supported therein by means of the bar F and screw G, Fig. 2. In the interior of the cylinder is placed the soft-iron core or magnet H, on which is a spool, I, provided with a wire coil or helix, J. Said magnet H is connected to and held in place by the bar F. Around the magnetic cylinder is a wire coil, K, Figs. 2 and 4, the inner end *a* of which connects with the inner end of the spool-wire at *a'*, and the outer end *b* of the coil K extends to the binding-post L, Fig 1. The outside wire *c* goes from the coil J to the binding-post M, Figs. 1 and 2. The relative position and connections of the cylinder, magnet, spool, and coils are shown in Figs. 2 and 3.

The vibrator D, Fig. 5, consists of a ring or frame, N, with a series of fine wires or springs, O, extending across the opening of the ring and secured at their ends to the side of said ring. This ring is placed within the case in such way that the wires or springs will run across the end of the cylinder, spool, and magnet transversely, and by means of the cap B, which fits down over the ring N, the vibrator is held in position, as seen in Fig. 2.

By having the vibrator made up of a series of fine wires or springs close to each other, it is rendered very acute and sensitive to acoustic influence, as each separate wire has its separate independent pole of polarities when in its close connection with the cylinder and magnet, and by this combination of the vibrator, cylinder, and core or magnet a large amount of electric volume is generated, and hence the communication is carried over the line with more energy than by ordinary telephonic action.

The wire *b* is coiled around this positive pole of the cylinder, which is of the strongest magnetic influence, and presenting a large magnetic surface to the wire. The wire *b* extends from the binding-post L, and forms one end of the coil around the cylinder, and the other end is seen at *a*, which passes to the spool coil J, and makes a connection at *a'* with the inner end of the coil J, while the outer end *c* of the coil J is carried to the binding-post M. These two coils are wrapped in the opposite direction, having their inside ends connected, so that the current generated by the outside coil K shall not be neutralized by that generated in the coil J, or vice versa. As a current of electricity passes through the wire of each helix J and K to the binding-posts, its action on the core or magnet H is greater than though of hard steel. Consequently, as a receiving-instrument, it has the power of both—that of the attraction given it by induction and the electricity which is transmitted over the line by the transmitting-instrument. The core H, placed inside of the coil J, becomes magnetized by induction. Although it is thus magnetized, it does not change its action when a current of electricity is acting through its coil J. There is a material difference in the power of attraction between a soft-iron core or magnet, H, and a hard-steel core when acted upon by an electric current; hence the great advantage of the soft-iron core or magnet H herein shown.

In using this instrument there is one or more placed at each end of the line, with suitable wire connections in the usual way. Now, by producing vibrations of the strings or wires of the vibrator for each vibration, a current of electricity is generated in the coils J and K, which is transmitted over the line to and through the coils in the instrument at the other end. The same result follows in case more than one instrument is in connection.

The vibrator, moved by the voice or otherwise, induces a current of electricity in the coils J and K, and in a receiving-instrument the currents induce a vibration of the wires of the vibrator.

Thus alternately the strings of the vibrator are attracted successively by each vibration toward the cylinder E and core H, and spring back to their former place as soon as the current is stopped. The more rapid the vibration of the wires or strings O the stronger and more rapid the currents over the line. Hence the vibrations which are produced upon the vibrator at one end of the line are repeated on the vibrator at the other end, delivering thereby the intelligence desired to be conveyed. The same result is produced at either end of the line from similar instruments when placed in connection, as shown.

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

1. In telephones, an improvement consisting of a vibrator composed of a series of wires or springs, a magnetic cylinder having a wire helix thereon, and a core or magnet with a wire coil arranged within said cylinder, substantially as and for the purpose set forth.

2. In a telephone, the vibrator O, or a series of wires or springs set transversely and opposite the opening of the mouth-piece, substantially as specified.

3. In telephones, an improvement consisting of the central core or magnet H, with a spool and helix thereon, surrounded by the cylinder E and its wire coil, in combination with the bar F, vibrator D, case A, and cover B, constructed and arranged substantially as described, and for the purpose specified.

4. In telephones, an improvement consisting of the cylinder and its coil surrounding the central magnet, its spool and helix connected with the bar F at one end, and having a wire vibrator at the other, and secured in a suitable case with an opening in direct relation with said vibrator, substantially as and for the purpose set forth.

5. In telephones, the combination of the vibrator D, the cylinder E, with a helix thereon, the central magnet H, spool I, and coil J, with the wires of said vibrator arranged transversely to the end of said cylinder and magnet, arranged in a suitable frame or case, substantially as described, and for the purpose set forth.

WEBSTER GILLETT.

Witnesses:
W. H. BURRIDGE,
JOHN H. BURRIDGE.