(No Model.)

T. D. LOCKWOOD.

ELECTRIC BATTERY TELEPHONE.

No. 307,478. Patented Nov. 4, 1884.

Fig. 1.

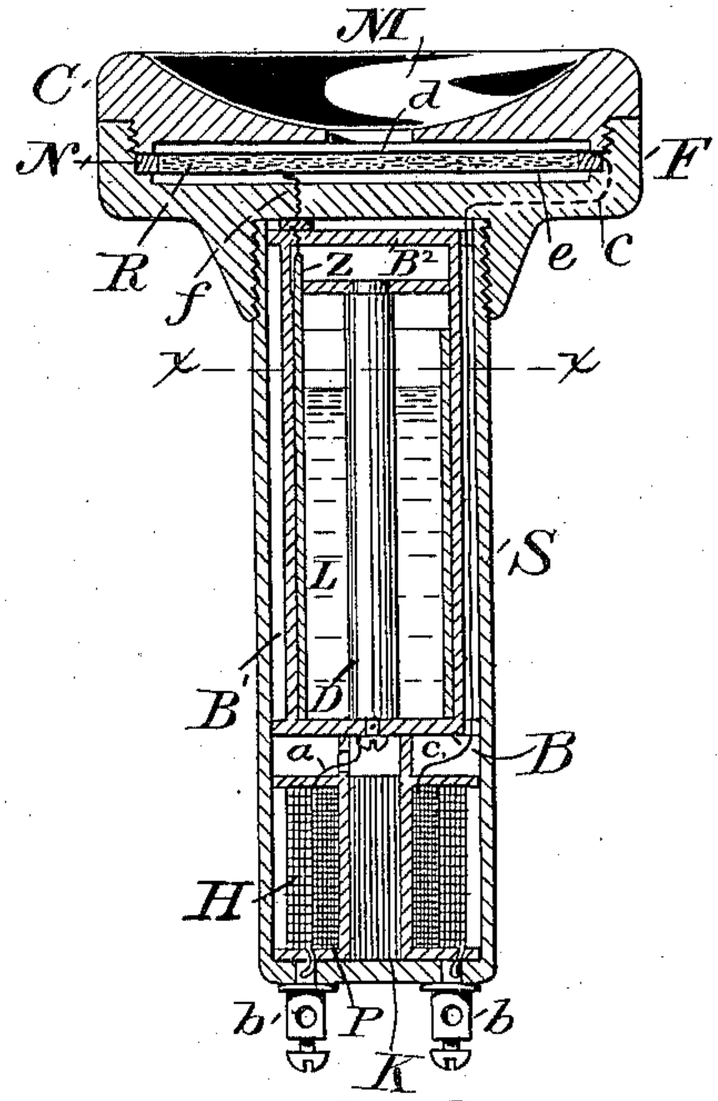

Fig. 3.

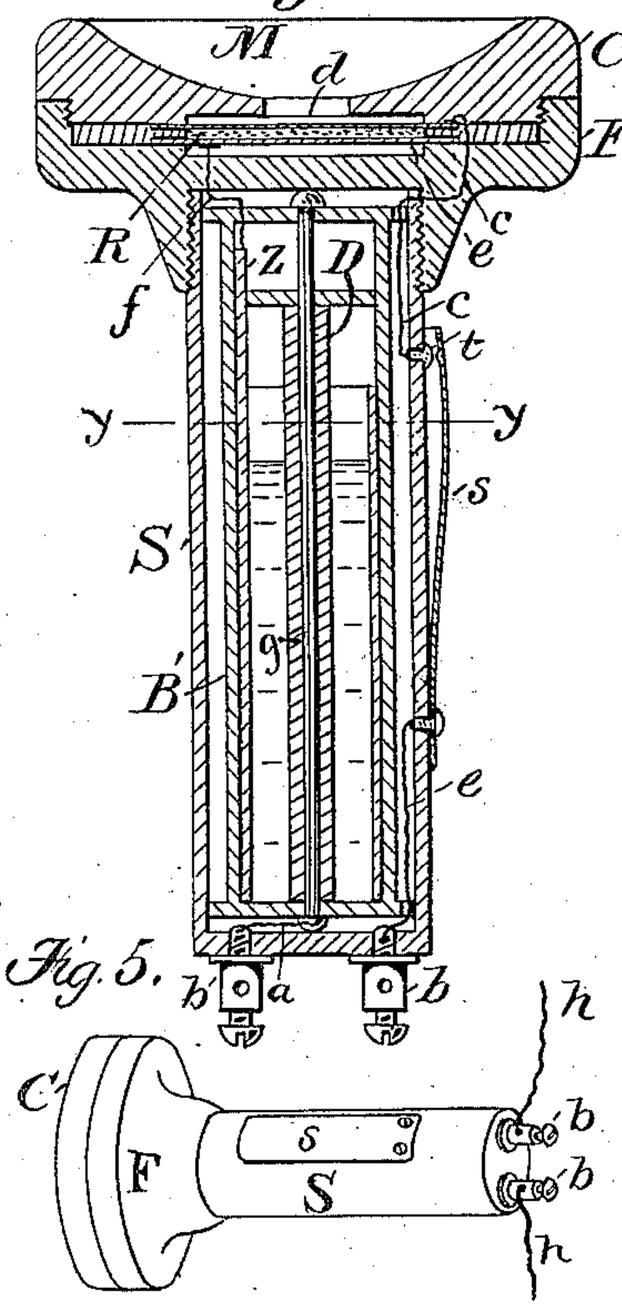

Fig. 2.

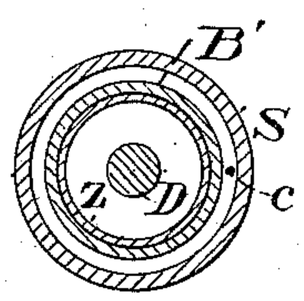

Fig. 4.

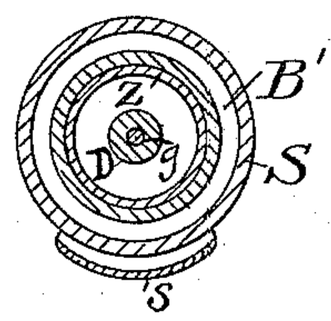

Fig. 5.

Witnesses.
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UNITED STATES PATENT OFFICE.

THOMAS D. LOCKWOOD, OF MALDEN, MASSACHUSETTS.

ELECTRIC-BATTERY TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 307,478, dated November 4, 1884.

Application filed February 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOS. D. LOCKWOOD, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Electric-Battery Telephones, of which the following is a specification.

My invention relates to electric telephones; and its object is the consolidation in a small compass and in a condensed and convenient form of the two necessary elements of a transmitting-telephone—*i. e.*, the source of electricity and the instruments whereby the electricity generated by the said source may be controlled and made to effect the electric transmission of speech.

Heretofore and prior to my invention the general practice has been to use a transmitting-telephone in any of its well-known forms—such as the Blake, Edison, or Hunnings transmitters—as a separate instrument, and to provide a battery for its energization in a separate box, which is arranged at any convenient distance therefrom, but which is usually placed a short distance below. The total resistance of the primary circuit, however, is low, and thus even the short distance which intervenes between the battery and the transmitter, when arranged in the ordinary manner, becomes important and might be lessened with advantage. Furthermore, it is obvious that if the battery and transmitter could be confined within small compass without decreasing their efficiency, the appearance of the entire apparatus would be greatly improved.

To this end my invention consists, as hereinafter described, of the combination in one instrument of a variable-resistance telephone with or without an inductorium, with a battery having in its circuit the electrodes or variable resistance of the said telephone, together with a suitable switch or circuit closer by which the circuit of the battery, normally open, may be closed when the transmitter is put in use.

The various improvements will be clearly understood on reference to the accompanying drawings, forming part of this specification, and the following description thereof—that is to say:

Figure 1 is a sectional elevation of my improved instrument, showing in one case the battery, induction-coil, and variable resistance provided with diaphragm and mouth-piece. Fig. 3 is a sectional elevation of a similar instrument in which the induction-coil is dispensed with. Fig. 2 is a cross-section of Fig. 1 on the line *x x*. Fig. 4 is a cross-section of Fig. 3 on the line *y y*, and Fig. 5 is a perspective view of Fig. 3.

The outer case, S, referring now to Figs. 1 and 2, may be, as usual, of hard rubber, wood, or any suitable material, and is fitted at the upper end with the diaphragm-seat F and cap C, the latter being provided with a mouth-piece, M.

The battery I use is substantially such as shown in Patent No. 293,563, dated February 12, 1884, and which consists of electrodes of zinc and silver-foil surmounted with silver chloride, the whole immersed in an exciting-solution of potassic or sodic sulphate, and hermetically sealed.

In the drawings the battery consists of a water-tube of hard rubber or like material, B′, of which B is the base-plate, and B^2 the upper plate or cover. Z is the zinc, which may be made of sheet-zinc bent nearly to the circular form. L is the liquid, and D represents the silver electrode and chloride of silver. A rod of brass, *g*, (see Figs. 3 and 4,) passes longitudinally through the center and serves to hold the parts together. This, though insulated from the silver-foil within the battery, may be connected thereto at the end to serve as the positive-battery pole. An inductorium, of which P is the primary and H the secondary coil and K the soft-iron core, is arranged below the battery, and both battery and coil are placed within the telephone-case S. A diaphragm or plate, of platinum, brass, or any other metal, *e*, is supported in the flaring diaphragm-seat F in the manner described in the patent of Henry Hunnings, No. 250,250, November 29, 1881, and according to the terms of the same patent a ring, N, of non-conducting material, is placed round the edges of the plate *e*, both to clamp the same and to constitute a cavity wherein is placed a quantity of granulated or pulverized carbon. A very thin diaphragm, of platinum, silver-foil, or sheet-iron, *d*, is now extended over the cavity, and is surmounted and clamped by the cap C.

The electric circuits may be traced as fol-

lows: Leaving the zinc pole Z, a wire, *f*, leads to the lower diaphragm, *e*, and from thence the circuit goes on through the variable resistance of the granulated carbon to the upper diaphragm, *d*, to wire *c*, to the primary coil P, and back by wire *a* to the positive pole D of the battery. The wires of the secondary coil H lead out through the binding-screws *b*.

In the form I show in Figs. 3 and 4 the induction-coil is dispensed with, and the battery-wires lead directly to and through the variable resistances. As shown in the drawings, the circuit of the battery is led through the spring circuit-closer *s*, whereby it may be maintained in a normally-open condition, except when actually in use. The circuit of this telephone is as follows: From the zinc pole of the battery a wire, *f*, leads to the lower metal plate or diaphragm, *e*, through the granulated carbon R, upper or vibrating diaphragm, *d*, and from thence by wire *c* to the stud *t* of the circuit-closer, where the circuit is normally open. From the silver pole D a wire, *a*, leads to one of the binding-posts *b*, while from the other binding-post a wire, *e*, is led to the circuit-closing spring *s*. When the telephone is grasped by the hand and used for the transmission of speech, the spring *s* is pressed upon the stud *t* and the circuit temporarily closed.

Although I prefer to use a transmitting-telephone of the type described, I am not restricted thereto, and may combine the battery in the same way with a Blake or Edison transmitter without departing from the essence of my invention.

I am aware that in German Patent No. 9,261, dated October 22, 1878, a telephone apparatus is shown comprising an induction-coil and battery in the same case with a transmitter, and consequently I do not claim such arrangement, broadly, as my invention. It does not appear, however, that the device referred to was ever used or designed to be used in different positions, the parts not being arranged in the case in such way as to prevent dislocation should the telephone be carelessly handled. In my invention the battery and induction-coil compactly fill the case, being arranged one above the other, close together and to the walls of the case, and being securely fastened to the latter. Moreover, I employ a hermetically-closed battery as peculiarly adapted to the end in view.

I do not broadly claim a spring circuit closer or controller combined with a telephone, as that is claimed in the patent granted October 10, 1882, to Thos. A. Watson, No. 265,897; but

What I do claim, and desire to secure by Letters Patent, is—

1. A telephone apparatus comprising an outer case, a transmitter in one end thereof, and a hermetically-closed liquid battery which substantially fills the space between the walls of said case and is secured thereto, as and for the purposes set forth.

2. The combination, in a hand-telephone, of an electric battery, a variable-resistance telephone, and a circuit-controller whereby the circuit of the battery is completed through the transmitting-telephone only when the instrument is grasped for use, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of January, 1884.

THOS. D. LOCKWOOD.

Witnesses:
FRED J. F. SCHWARTZ,
GEO. WILLIS PIERCE.