No Model.)

T. D. LOCKWOOD.

TRANSMITTING APPARATUS FOR TELEPHONE LINES.

No. 281,895. Patented July 24, 1883.

Fig: 1.

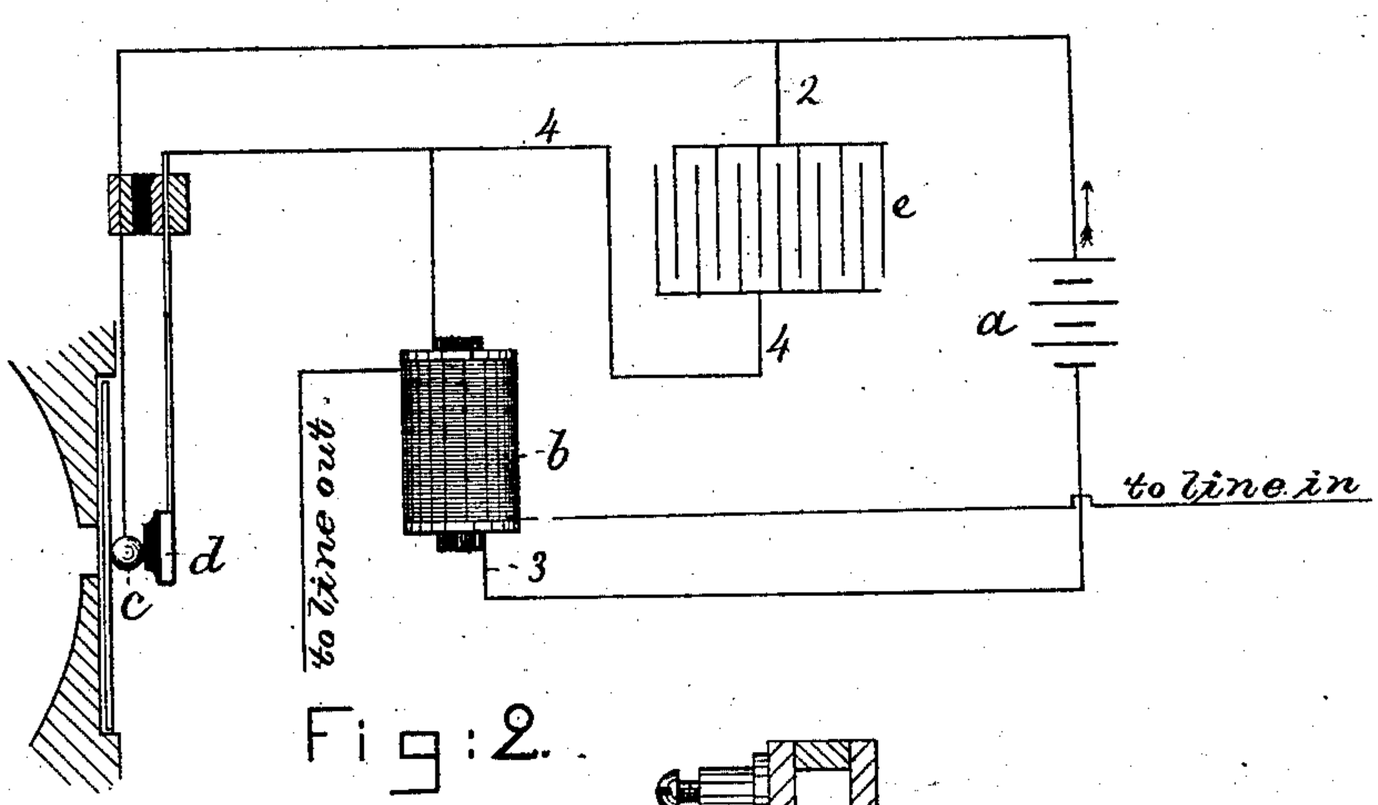


Fig: 2.

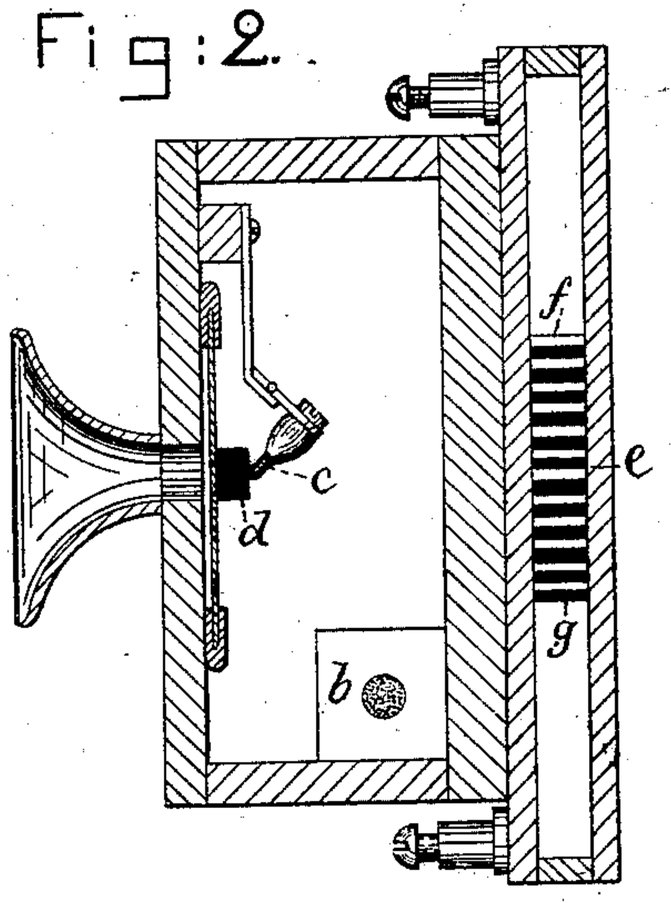
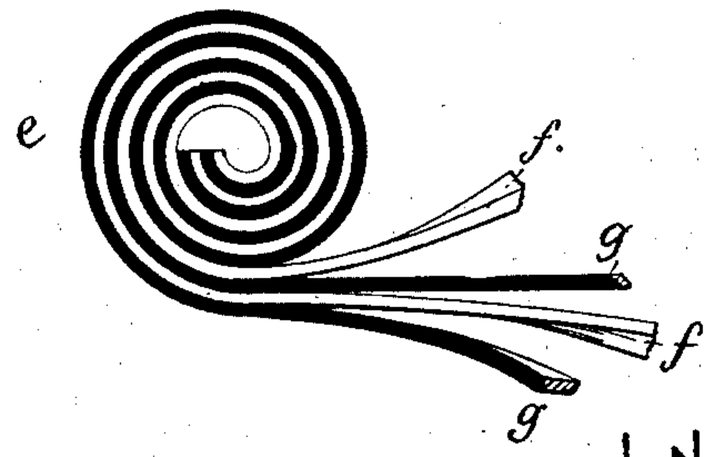


Fig: 3.



WITNESSES—

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UNITED STATES PATENT OFFICE.

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TRANSMITTING APPARATUS FOR TELEPHONE-LINES.

SPECIFICATION forming part of Letters Patent No. 281,895, dated July 24, 1883.

Application filed February 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS D. LOCKWOOD, of Malden, county of Middlesex, State of Massachusetts, have invented new and useful Improvements in Transmitting Apparatus for Telephone-Lines, of which the following description, taken in connection with the accompanying drawings, forms a specification.

This invention has reference to telephone-lines employing for the production of the undulatory current a battery-telephone or instrument for varying the resistance of a circuit which includes a battery; and it has special reference to those using, in connection with an induction-coil, an instrument which varies the resistance by variations of pressure of an electrode having a convex contact-surface against another. In instruments of this type the contact, being between small areas—in fact, at a single point—is very delicate, and the operation proceeds by minute recessions and approaches of the contact-surfaces, which, though insufficient in the ordinary operation wholly to interrupt the current, do cause occasional breaks, as shown by the production of sparks between the electrodes. These breaks and the resultant sparks are by no means desirable accompaniments of the operation, since transmission is thereby impaired and the electrodes injured. Consequently feeble batteries only have been used in the local transmitter-circuit, since the tendency to break and produce sparks increases with the electro-motive force of the battery in circuit. Small induction-coils are also used, the spark being less with them than with large coils. The use of heavy batteries and of large induction-coils also is often desirable in order to increase the induced currents on the line, so that they may traverse long lines—such as those between cities, for example—without becoming too feeble to operate the receiving-instrument. The difficulty may be overcome by placing a condenser in a shunt or branch around the contact pieces or electrodes of the transmitter, the condenser preventing the production of sparks and enabling the instrument to be used with heavier battery and larger induction-coils than practicable with the instrument alone.

The present invention comprises the special combination and arrangement of the contact-telephone, induction-coil, and condenser in one instrument.

Figure 1 is a diagram of a telephone transmitting apparatus constructed in accordance with the invention; Fig. 2, a vertical section of an instrument containing all the necessary parts of the said transmitting apparatus; and Fig. 3, a detail view of the preferred form of condenser, the same being detached from the instrument in which it is to be used and partly unrolled to show the construction.

The contact-telephone, Figs. 1 and 2, has two electrodes or contact-pieces, *c d*, of which one has a convex or rounded surface, so that the area in contact is very small, and the contact therefore very delicate. The circuit of the battery *a* includes the primary helix of an induction-coil, *b*, and the electrodes *c d*. The condenser *e* has one pole connected by the wire 2 with the battery-circuit between the electrodes *c d* and the terminal 3 of the primary helix of the induction-coil *b*. The other pole is connected by the wire 4 with the battery-circuit on the other side of the electrodes. The condenser is thus included in a shunt or branch, 2 4, around the electrodes.

In the instrument shown in Fig. 2 the case has a double back, and the condenser, which is or may be formed by rolling together metal sheets *f*, with strips *g* of insulating material between them, is placed between the two backs, so that it is out of the way and perfectly protected. The induction-coil is placed in the front compartment. The connections are as above described. The metal strips *f*, as shown, are greatly exaggerated in thickness.

The insulating-strips *g* may be of silk or paraffine-paper.

I claim—

A battery-telephone comprising, in combination, the following elements: a case having a double back, a condenser placed between said backs, an induction-coil in the front compartment of the case, the diaphragm and electrodes, and the electrical connections, substantially as described.

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

THOS. D. LOCKWOOD.

Witnesses:
JOS. P. LIVERMORE,
W. H. SIGSTON.