(No Model.)

T. A. EDISON.

TELEPHONIC REPEATER.

No. 340,707. Patented Apr. 27, 1886.

Fig. 1.

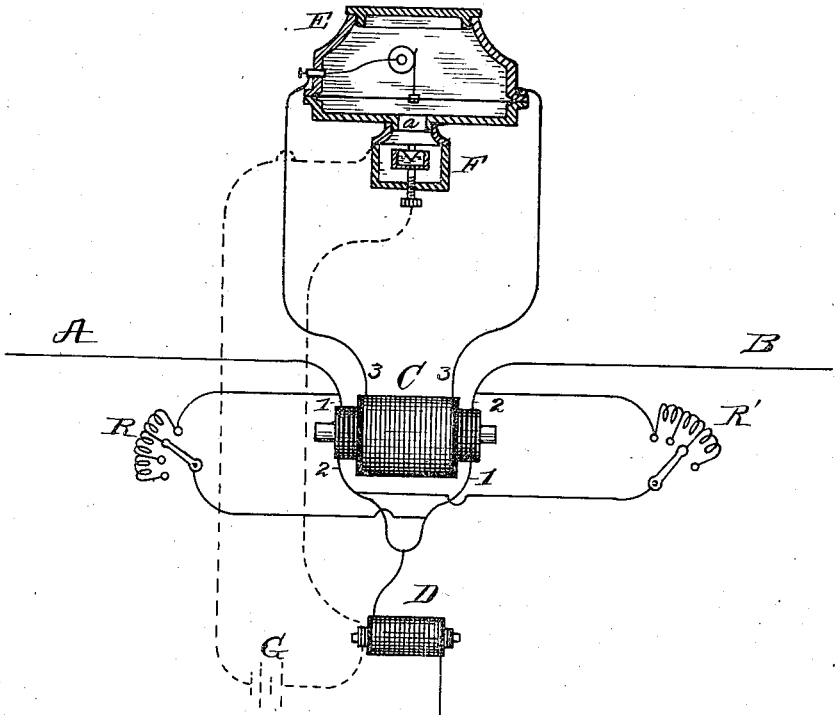
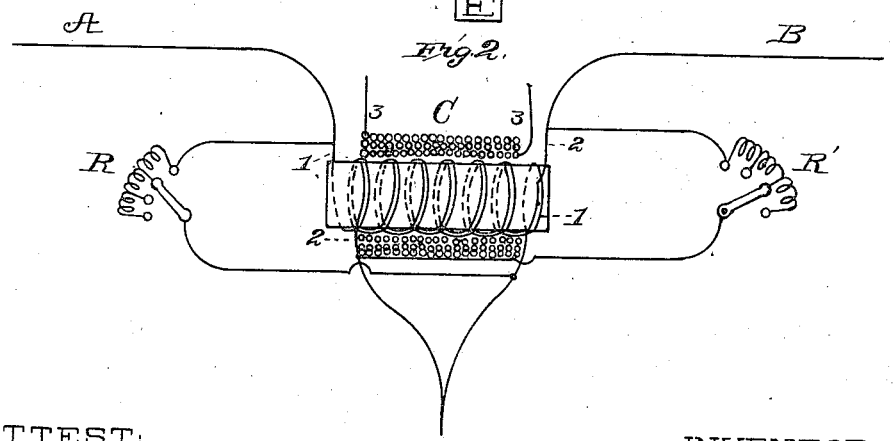


Fig. 2.



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TELEPHONIC REPEATER.

SPECIFICATION forming part of Letters Patent No. 340,707, dated April 27, 1886.

Application filed December 15, 1884. Serial No. 150,347. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Telephone-Repeaters, (Case No. 639,) of which the following is a specification.

The object I have in view is to produce a telephone-repeater for relaying telephone undulations from either of two lines to the other, which will operate without the use of switches for changing the line and local circuits in the relay apparatus, and will at the same time produce clear articulation free from the confusion produced by the reciprocal action of the repeating-instruments.

A further object is to produce an arrangement whereby a single combined receiver and transmitter can be used to relay in either direction without the use of switching apparatus, and also to provide means whereby my devices for relaying in either direction without switches can be used effectively with connected lines of widely-different resistances.

The invention will be better understood by reference to the accompanying drawings, in which Figure 1 is a view principally in diagram of a telephone-repeater embodying my invention, and Fig. 2 a view in detail of the receiving induction-coil.

A and B are two telephone-lines, which are connected with different circuits 1 2 of the induction-coil C. The induction-circuits 1 and 2 are formed of wire wound together upon the core, the lines A B being connected at opposite ends of the core to the two circuits, so as to oppose each other in their inductive action. The other ends of the induction-circuits 1 2 are connected together and through the secondary of induction-coil D to earth. The induction-coil C has a third circuit, 3, in which is located the receiver E. This is an electro-motograph receiver, the chalk-cylinder of which is kept rotating constantly by any suitable means. F is a telephone-transmitter of any suitable construction. Its case is connected with the receiver-case by a channel, *a*, with closed walls. The transmitter is in circuit with primary of D and with a battery, G.

In speaking over either line the current-undulations will pass through 1 or 2 of C, and to earth through secondary of D, the greater resistance of the other line preventing any action in the other circuit (2 or 1) of C. The electro-motograph receiver will be operated by induction, and will throw sound-waves through channel *a* onto the transmitter-diaphragm. The transmitter acting through primary of D the induced undulations in secondary of D will pass out through both 1 and 2 of C upon both lines. The induction in C will be neutralized, and the reaction upon the receiver prevented.

For working connected lines of widely-different resistances adjustable resistances R and R′ are used for balancing the lines, which resistances are located in shunts around coils 1 and 2 of induction coil C. By adjusting these resistances the action of the induction in the coils 1 and 2 can be made equal, so that the inductive action from repeating-coil D will be neutralized in receiving-coil C.

What I claim is—

1. In a telephone-repeater, the combination, with two telephone-lines, of a receiving induction-coil having two opposing primary circuits and a repeating induction-coil whose secondary circuit is connected with both the primary circuits of the receiving induction-coil, substantially as set forth.

2. In a telephone-repeater, the combination, with two telephone-lines, of a receiving induction-coil having two opposing primary circuits, a repeating induction-coil whose secondary is in circuit with both said primary circuits, and a repeating telephone-receiver operated by induction from the receiving induction-coil, substantially as set forth.

3. In a telephone-repeater, the combination, with two telephone-lines, of a receiving induction-coil having two opposing primary circuits connected with said lines, a repeating telephone-receiver in the secondary circuit of such receiving-coil, a transmitting induction-coil having its secondary in circuit with the opposing circuits of the receiving induction-coil, and a repeating telephone-transmitter worked by the receiver and located in the primary circuit of the repeating induction-coil, substantially as set forth.

4. In a telephone-repeater, the combination, with two telephone-lines, of a receiving induc-

tion-coil having two opposing primary circuits, a repeating induction-coil whose secondary circuit is connected with both said primary circuits, and resistances for balancing the lines, substantially as set forth.

5. In a telephone-repeater, the combination, with two telephone-lines, of a receiving induction-coil having two opposing primary circuits, a repeating induction-coil whose secondary circuit is connected with both said primary circuits, and resistances located in shunts around such opposing primary circuits for balancing the lines, substantially as set forth.

This specification signed and witnessed this 9th day of December, 1884.

THOS. A. EDISON.

Witnesses:
WM. H. MEADOWCROFT,
THOS. G. GREENE, Jr.