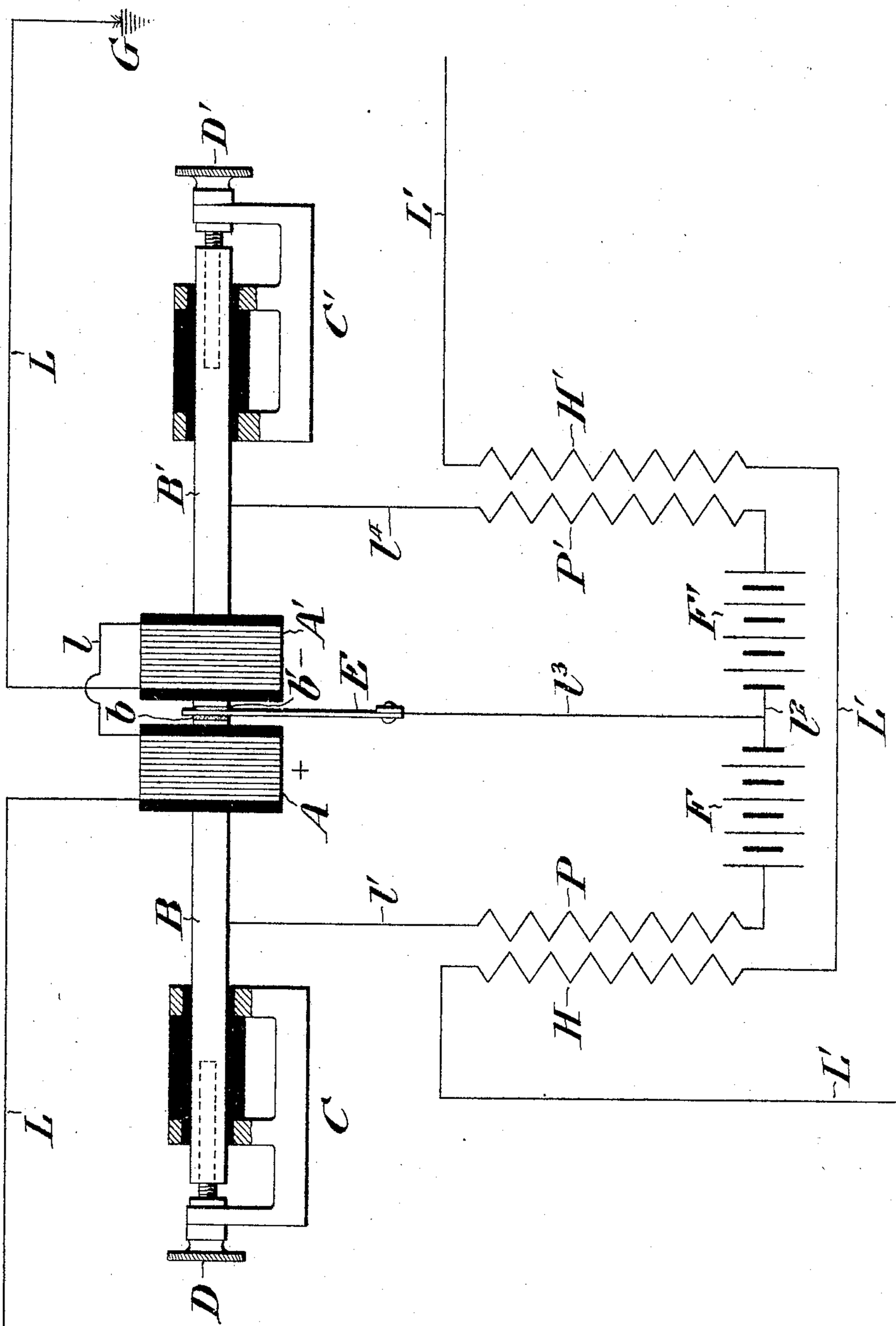
No. 770,296. PATENTED SEPT. 20, 1904.

I. KITSEE.

TELEPHONIC RELAY.

APPLICATION FILED JAN. 8, 1903.

NO MODEL.



WITNESSES:

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No. 770,296. Patented September 20, 1904.

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO KEYSTONE STATE TELEPHONE AND TELEGRAPH COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TELEPHONIC RELAY.

SPECIFICATION forming part of Letters Patent No. 770,296, dated September 20, 1904.

Application filed January 8, 1903. Serial No. 138,243. (No model.)

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Telephonic Relays, whereof the following is a specification, reference being had to the accompanying drawing.

My improvements relate particularly to relays of the class comprising a polarized armature; and it is the object of my invention to provide a device which is not only mechanically simple and compact, but capable of the most efficient utilization of the feeble electrical impulses which are to be relayed or intensified.

It is characteristic of my invention, as hereinafter described, that the polarized armature is always in electrical connection with the cores of the electromagnets in the transmitting-circuit, such connection being established through microphonic material which is interposed between the polarized armature and the opposed oppositely-polarized ends of said cores and said material being in the magnetic lines of force between the opposing poles of said magnets.

My invention comprehends the various novel features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawing I have shown a convenient form of my invention embodied in a single-wire system. However, it is to be understood that I do not desire to limit myself to such embodiment as my improved relay may of course be utilized in connection with a two-wire system.

Referring to the drawing, L is the transmitting-line, which is grounded at G, and L′ is the receiving-line, which is grounded at G′. The magnet-coils A A′ are included in said transmitting-circuit L and are respectively provided with cores B B′, independently supported in the frames C C′ and adapted to be respectively adjusted toward and away from each other by means of the screws D D′.

The polarized armature E is conveniently formed of a flexible magnetized steel strip, whose upper extremity extends between the opposed cores B B′ and is continuously maintained in electrical connection therewith by conductors *b b′*, whose conductivity is variable. Said conductors *b b′* may be attached either to said armature or to said cores and may consist of any material suitable for employment in microphones for telephonic transmission—for instance, powdered carbon, pulverized or black platinum, &c.

The core B is included in a local circuit comprising the wire *l′*, the primary induction-coil P, the battery F, wire l^2, wire l^3, armature E, and conductor *b*.

The core B′ is included in a local circuit comprising the wire l^4, the primary induction-coil P′, battery F′, wire l^2, wire l^3, armature E, and conductor *b′*.

It is to be understood that the magnet-coils A A′, which are connected by the wire *l*, are so wound and related to the transmitting-circuit L that current flowing in the latter serves to oppositely polarize the inner ends of the cores B B′, which are opposed to the armature E, and that the secondary induction-coils H H′, which are included in the receiving-circuit L′, are respectively in operative relation with the primary coils P and P′.

The device above described operates as follows: A current impulse in the transmitting-line L, tending to make the inner end of core B the north pole, will repel the free end of the armature E, (supposing that said end is of the same polarity;) but at the same time said armature will be attracted by the inner end of the core B′, which the same current impulse has made the south pole. Every repulsion of the armature E from the inner end of the core B will lessen the normal conductivity of the microphonic conductor *b* and diminish the current-flow in the primary coil P, and therefore induce a current in the secondary coil H. Likewise every attraction of the free end of the armature E toward the inner end of the core B′ will increase the normal conductivity of the microphonic conductor *b′* and increase the current-flow in the primary

coil P′ and induce a current of opposite direction in the secondary coil H′. Therefore as the batteries F F′ are connected in opposition to each other and the secondary coils H H′ are connected in series with each other the impulses induced simultaneously in said secondary coils reinforce each other. Therefore it is to be understood that with proper proportions of coils, voltage, &c., an impulse of given intensity in the transmitting-circuit L may be utilized to occasion an impulse of greater intensity in the circuit L′, so that no matter how feeble the incoming impulse upon the line L may be the outgoing impulse upon the line L′ shall have sufficient intensity to actuate the receiving instruments connected at the opposite end of that line.

I do not desire to limit myself to the precise details of construction and arrangement herein described, as it is obvious that various modifications may be made therein without departing from the essential features of my invention.

I claim—

1. In a telephonic relay, the combination with electromagnetic coils included in a transmitting-line circuit and provided with opposed cores; of a polarized armature interposed between the proximate ends of said cores; microphonic material electrically connecting said armature to said cores; and local circuits including the primary of an induction-coil and a source of current connected to said cores and armature, the secondary of said induction-coil being included in a receiving-line circuit, substantially as set forth.

2. In a telephonic relay, the combination with two electromagnetic coils included in a transmitting-line circuit and provided with opposed cores; of a polarized armature interposed between the proximate ends of said cores; microphonic material electrically connecting said armature to said cores; and local circuits including two sets of batteries and two primary induction-coils, in respective electrical connection with said cores and said armature; the secondaries of said induction-coils being included in a receiving-line circuit, substantially as set forth.

3. In a telephonic relay, the combination with two electromagnetic coils adapted to be connected in a transmitting-line circuit and provided with opposed cores; of a polarized armature interposed between the proximate ends of said cores; microphonic material on opposite sides of said armature; local circuits containing a source of current whose terminals are respectively connected with said armature and said microphonic material; and, a primary induction-coil in each of said local circuits, provided with a secondary coil adapted to be connected in a receiving-line circuit, substantially as set forth.

4. In a telephonic relay, the combination with two sets of coils included in a transmitting-circuit and each provided with an adjustable core; of a polarized armature interposed between said cores; microphonic material electrically connecting said cores with the respectively opposite sides of said armature; and means to adjust said cores toward and away from said armature, substantially as set forth.

In testimony whereof I sign my name, this 7th day of January, A. D. 1903, in the presence of two subscribing witnesses.

ISIDOR KITSEE.

Witnesses:
JAMES H. BELL,
WM. F. WALLACE.