No. 631,150. Patented Aug. 15, 1899.

H. BROCKELT.

TELEPHONE CIRCUIT.

(Application filed Apr. 6, 1898.)

(No Model.)

Fig. 1

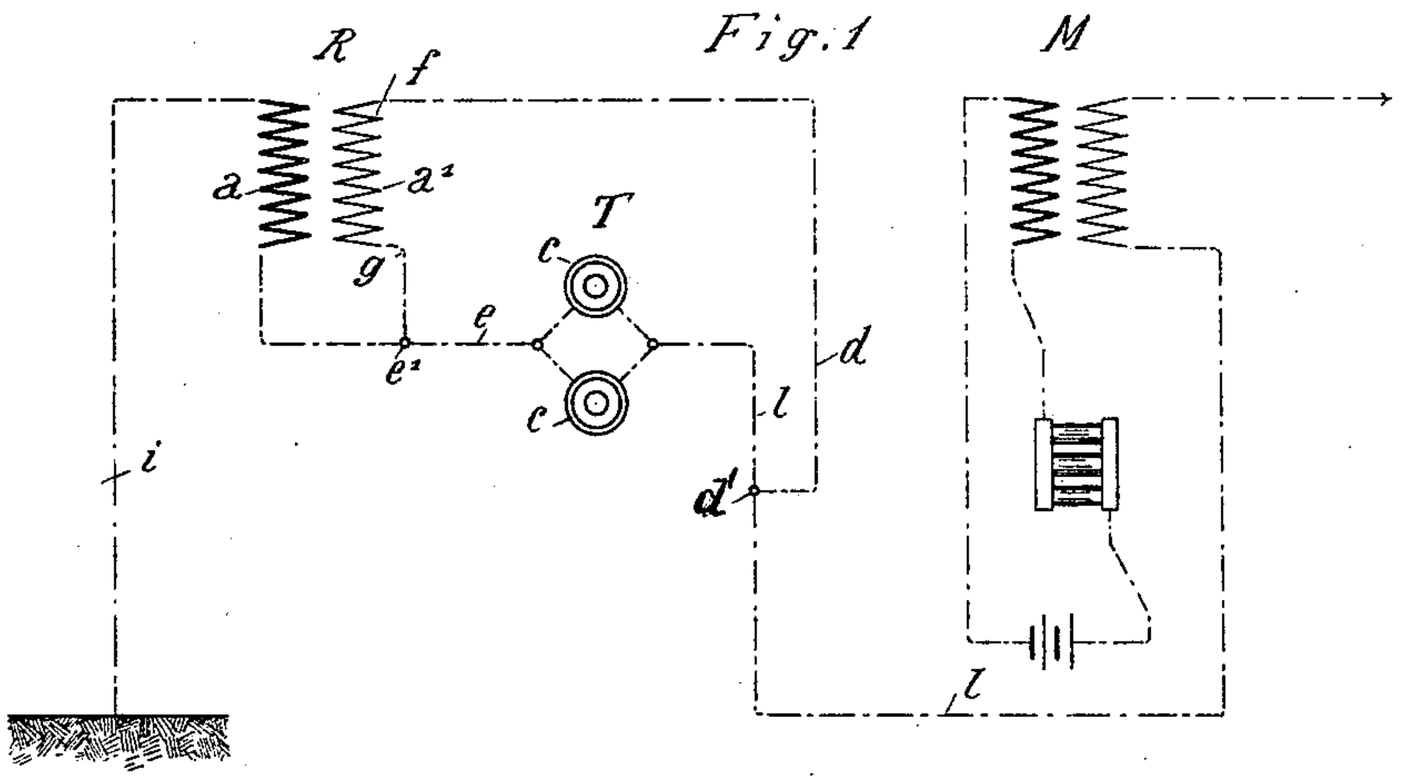
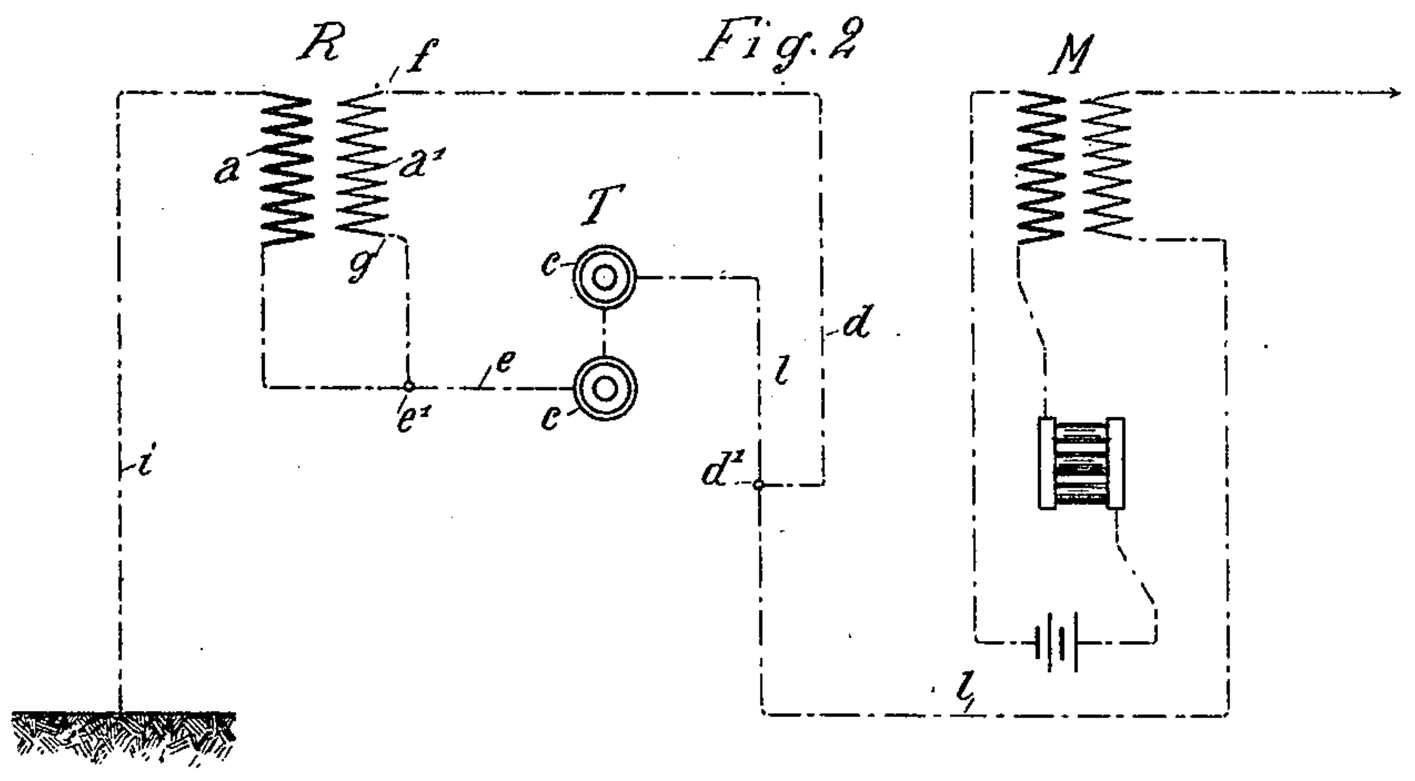


Fig. 2



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UNITED STATES PATENT OFFICE.

HERMANN BROCKELT, OF DRESDEN, GERMANY.

TELEPHONE-CIRCUIT.

SPECIFICATION forming part of Letters Patent No. 631,150, dated August 15, 1899.

Application filed April 6, 1898. Serial No. 676,647. (No model.)

To all whom it may concern:

Be it known that I, HERMANN BROCKELT, of Dresden, in the Kingdom of Saxony and Empire of Germany, have invented certain new and useful Improvements in Telephone-Circuits, of which the following is a specification.

When strong currents are used for telephones, a great inconvenience occurs in that the induction upon adjacent telephone-wires is so disturbing in its effect that often communication is impossible for those using the instrument. Many attempts have been made to obviate the noises produced by the induction, and even return-wires have been established instead of closing the circuit, as usual, through the earth. However, the use of return-wires has proved to be unsuccessful in avoiding completely the disturbing noises. All other experiments have failed to give a good result or have been impracticable in device and effect.

The present invention is based upon the idea of diminishing the induction produced by a strong current to a fraction of the present volume by a counter induction, so that, as practical trials have shown, speech is transmitted completely clear and distinct and free from the slightest foreign noise. By this arrangement also a long-felt inconvenience is avoided—the transmission of conversations over adjacent wires, which is generally very disagreeable.

According to my invention the receivers are either connected in parallel or in series, according to the rest of the device, apparatus, and length of line.

In the accompanying drawings two modes of execution are illustrated as an example.

Figure 1 shows the receivers connected in parallel. Fig. 2 shows the same connected in series.

When the receivers are connected in parallel, as in Fig. 1, one end of the primary solenoid *a* of the induction-coil R is connected with the receivers *c c* of a telephone T by means of the conductor *e*, while the other end of the primary is connected with the ground by a wire or conductor. The secondary solenoid *a'* of the induction-coil R is connected at the extremity *g* with the conductor *e* at the point *e'*, and the other extremity *f*, through the wire *d*, joins at *d'* with the conductor *l*, leading from the receivers *c c* to the secondary coil of the induction-coil M. When the receivers are connected in series, Fig. 2, one end *f* of the secondary solenoid is also connected by the wire *d* to the conductor *l*, while the other end *g* is connected at *e'* to the conductor *e*.

The operation of the described device when the receivers are connected in parallel or in series is the following: The induction-coil R having its primary winding *a* in the main circuit and its secondary winding *a'* in the shunt-circuit, the main current will produce an induction in the secondary winding *a'* and the induced current will circulate in a direction opposite to the direction of the main current on its way through the receivers, thus compensating the same for the larger part, so that the induced current produced by an electric current of a certain strong volume is not in a condition to have a disturbing effect upon the receiver. If the induction and the counter induction were of equal force, the effect upon the receivers would be equal to zero. This state of equilibrium cannot be obtained practically; but the disturbances caused by the induction can be counteracted so far that the noises can have no bad influence upon a conversation kept up through a telephone.

Having thus described my invention, I claim—

1. In a telephone system, the combination of a main circuit leading to ground, a pair of receivers in said main circuit, a microphone, a battery, an induction-coil M having its primary in circuit with the battery and microphone and its secondary in the main, and an induction-coil R having its primary *a* in the main circuit, and its secondary *a'* in a branch of said circuit with said receivers, as and for the purpose set forth.

2. In a telephone system, the combination of a main circuit leading to ground, a pair of receivers in said main circuit in parallel with each other, a microphone, a battery, an induction-coil M having its primary in circuit with the battery and microphone and its secondary in the main, and an induction-coil R having its primary *a* in the main circuit, and its secondary *a'* in a branch of said circuit with said receivers, as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HERMANN BROCKELT.

Witnesses:

W. MAJDERICZ,

HERNANDO DE SOTO.