

W. K. HOWE.  
 MEANS FOR REDUCING THE REACTANCE OF ELECTROMAGNETIC DEVICES  
 FOR TELEPHONE CIRCUITS.

APPLICATION FILED APR. 13, 1909.

934,811.

Patented Sept. 21, 1909.

FIG. 1.

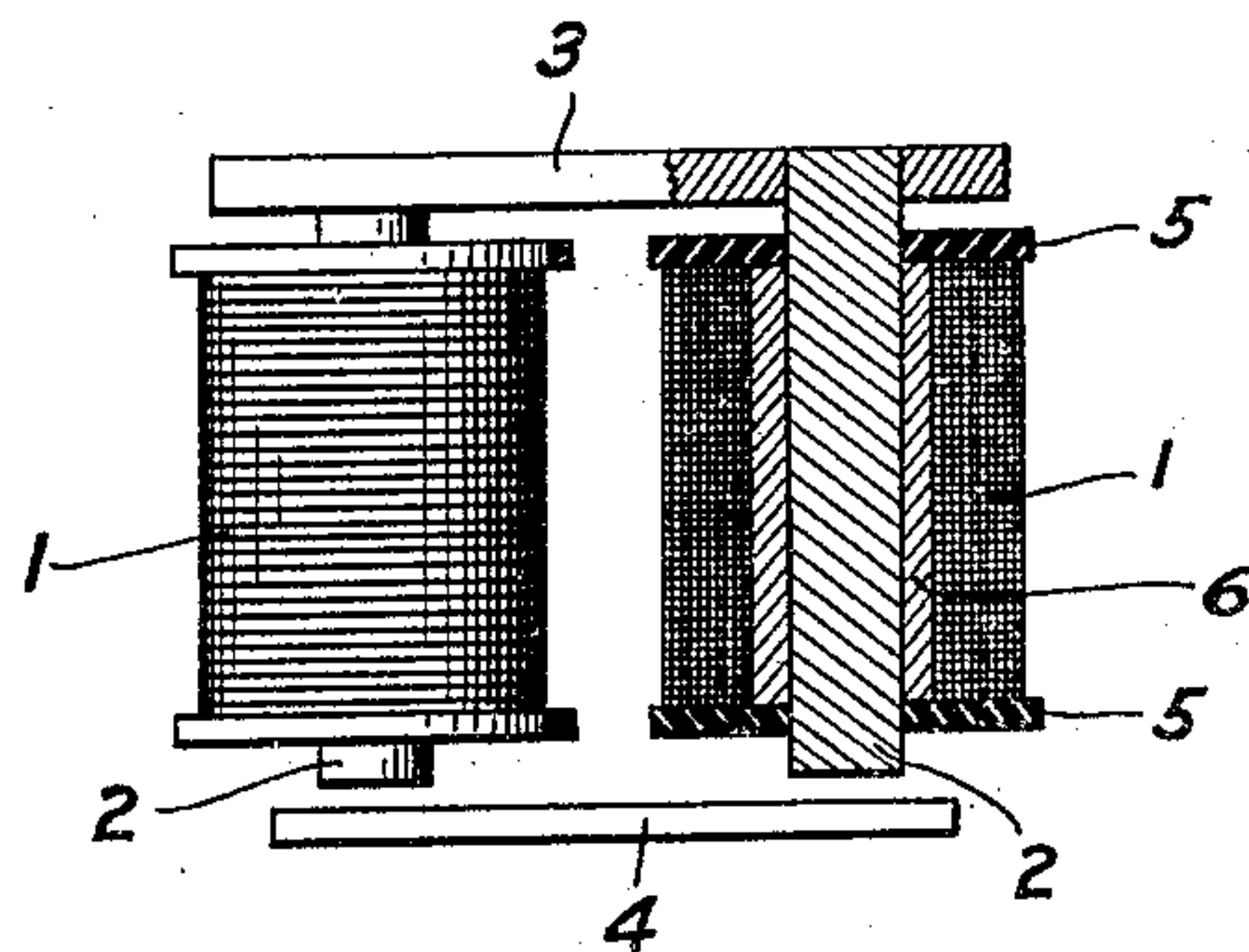
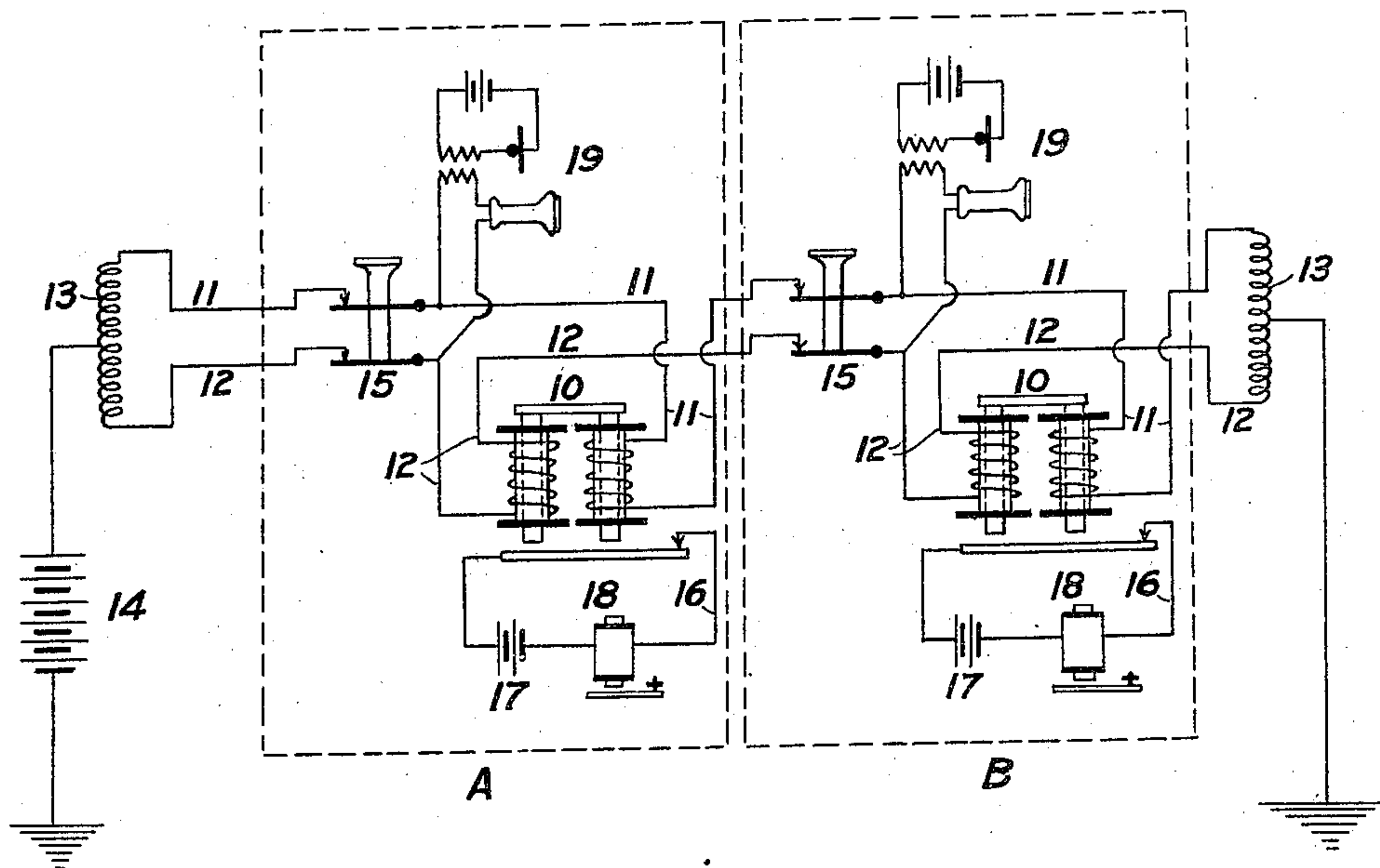


FIG. 2.



WITNESSES:

*L. Thon*  
*E. W. Carroll*

INVENTOR

*Winthrop K. Howe*  
*by O. J. Smith & Son*  
*his attys*



# UNITED STATES PATENT OFFICE.

WINTHROP K. HOWE, OF ROCHESTER, NEW YORK, ASSIGNOR TO GENERAL RAILWAY SIGNAL COMPANY, OF GATES, NEW YORK, A CORPORATION OF NEW YORK.

MEANS FOR REDUCING THE REACTANCE OF ELECTROMAGNETIC DEVICES FOR TELEPHONE-CIRCUITS.

934,811.

Specification of Letters Patent.

Patented Sept. 21, 1909.

Application filed April 13, 1908. Serial No. 489,742.

*To all whom it may concern:*

Be it known that I, WINTHROP K. HOWE, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Means for Reducing the Reactance of Electromagnetic Devices for Telephone-Circuits, of which the following is a specification.

This invention relates to means for reducing the reactance of electromagnetic devices in telephone circuits.

The invention consists in the apparatus hereinafter described and claimed.

In the drawings:—Figure 1 is an elevation of a pair of electromagnets, one of which is shown in vertical section, embodying this invention; and Fig. 2 is a diagram of an apparatus in which this invention is employed in connection with a telephone circuit.

In Fig. 1 is shown an electromagnet having the windings 1, and the usual iron cores 2. 3 is the yoke connecting the cores of the two magnets, and 4 represents a movable armature. In a manner that is common, the ends of the coil 1 may have insulating disks 5. Around the core 2 and between it and the wire winding 1, a tubular copper sheath 6 is introduced, whereby the reactance of the circuit, of which the winding 1 forms a part, is decreased, or, in other words, the electromagnet is made substantially or largely noninductive.

In Fig. 2, the invention is shown in connection with a telephone circuit, and two stations A and B are indicated in the diagram, which, of course, may be separated at any suitable distance. At each station is the noninductive relay 10 of the character above described. This relay is inserted in the two lines 11 and 12 of the telephone circuit 1. Each of these two lines runs through one coil of each of the relays 10, and the other of said two lines runs through the other coil thereof, for the purpose of keeping the lines in balance for telephoning purposes. At the ends of the lines 11 and 12 are reactance coils 13, having a sufficiently high reactance to prevent the telephone current from being shunted through them. A line battery 14

connects ground and one of the reactance coils 13, and the other reactance coil is connected with the ground. A key is provided at each station for breaking the circuit simultaneously in both of the lines 11 and 12, whereby the circuit through both coils of the relays 10 is uninterrupted. Each relay 10 controls a local circuit 16, including a local battery 17, and a translating device 18. This translating device in the present instance is indicated as an electromagnet having an armature which may be used for signaling purposes, and for which other forms of electromagnetic signaling devices may be employed. At each station is a telephone outfit 19 including the usual elements thereof, which is arranged as usual in connection with the lines 11 and 12.

The operation of the device is as follows: For signaling purposes a key 15 is opened and closed in any desired manner, and in response the translating devices 18 are operated. If a sounder is used as the translating device, telegraphing may be carried on over the line. The translating device may be employed as a call for telephone purposes, and the call may be effected by operating the key 15, whereupon the operators at the calling and the called stations may make use of their telephones 19.

By means of the noninductive relay or electromagnetic devices herein set forth, the employment of the ordinary direct current for energizing the relays 10 is made possible without interfering with the use of the telephones on the same circuit. By this means an electromagnetic device may be introduced into the telephone circuit without creating detrimental impedance to the talking current.

It is obvious that the relay 10 may be used directly as a translating device without the employment of a secondary circuit with its devices, in all cases where the power of the relay 10 is sufficient to accomplish the desired action.

What I claim is:—

1. The combination of a telephone circuit, telephones in the circuit, an electromagnetic device in said circuit having a tubular copper sheath immediately around its core, a source



of current for energizing the electromagnetic device, and means in the circuit for controlling the electromagnetic device.

2. The combination of a two-wire telephone circuit, a series of telephones connected with the two wires of the circuit, a series of keys for making and breaking both lines of said circuit, an electromagnetic device having two coils one in each of said lines and

a tubular copper sheath immediately around the core of each coil, and a source of current connected with said telephone circuit for energizing the electromagnetic device.

WINTHROP K. HOWE.

Witnesses:

F. L. DODGSON,  
W. A. JACKSON.