O. T. LADEMAN.

TRANSMISSION SYSTEM.

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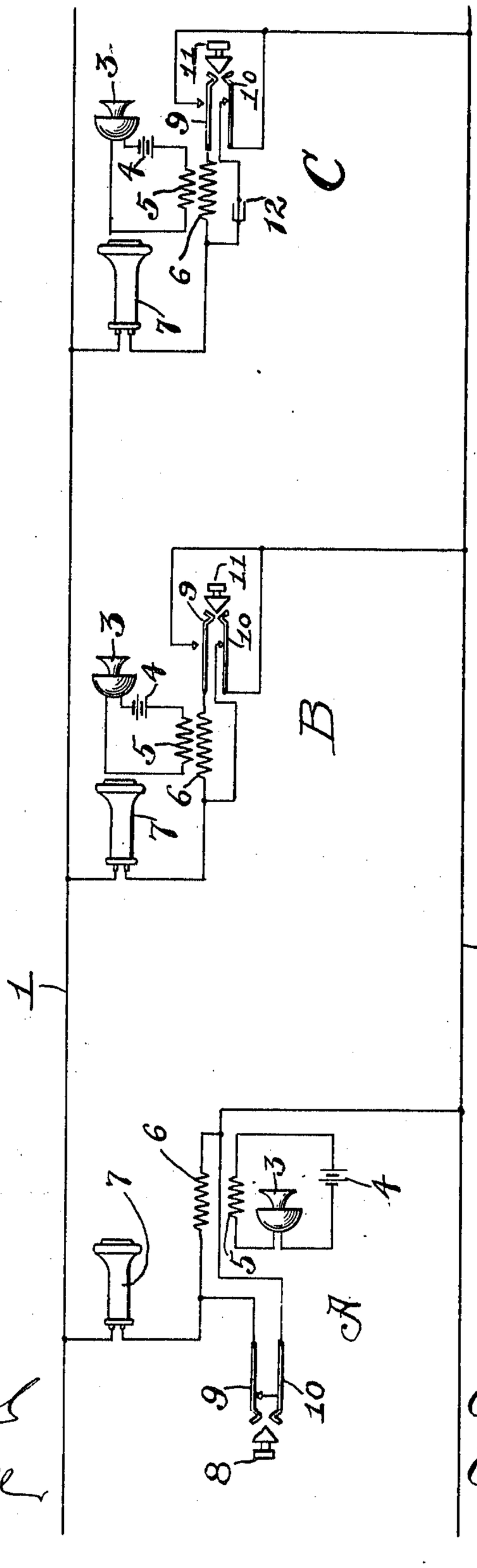
956,109.

Patented Apr. 26, 1910.



Witnesses

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TRANSMISSION SYSTEM.

956,109. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed December 15, 1908. Serial No. 467,654.

To all whom it may concern:

Be it known that I, OTTO T. LADEMAN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Transmission Systems, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to transmission systems, and has for its object the provision of improved circuit arrangements whereby it is possible to broaden the usefulness of the telephonic devices in connection with railroad or kindred circuits.

In the addition of telephone appliances to railroad telegraph circuits it has been found very difficult to carry on proper conversation over the high resistance telegraph circuits. It is well understood that telegraph circuits are operated over very high resistances, and in applying telephonic appliances to these circuits it is necessary that they likewise operate over these same high resistance circuits.

My invention contemplates the provision of telephonic substation circuit arrangements which will permit of operation over very high resistance circuits. The means which I employ to accomplish this end will be explained more in detail in connection with the accompanying drawing, illustrating the preferred embodiment thereof. In this drawing I have shown a transmission line 1—2, but have omitted to show any other instrumentalities on this line, it being assumed that this line is supposedly a high resistance line, as may be met with for instance along railroads.

I have shown three stations A, B and C, which are designed for intercommunication. I have omitted to show the signaling arrangement by which the various substations can call among themselves, as not being necessary in my present invention.

Referring more particularly to the apparatus at station A, I provide here a transmitter 3, local battery 4, and primary 5 of an induction coil. The primary 5 is in inductive relation with the secondary 6. The secondary winding 6 is in bridge of the main conductors 1 and 2, in serial arrangement with a receiver 7.

I show a short-circuiting switch, comprising the button 8, in association with two springs 9 and 10, which springs normally short circuit the secondary winding 6. I have found in my experiments that I get very much better transmission results if I am enabled to wind the secondary coil 6 of the induction coil to a very high resistance. This, however, would be objectionable at the receiving end in that it cuts down the efficiency of voice currents which may come to the receiving end over the transmission conductors 1 and 2. To receive the benefit of the high resistance winding, however, and to offset its defective qualities, I use the arrangement explained, which is that I wind the secondary coil 6 to a very high resistance, thus to get a very great efficiency of the talking currents emanating from the transmitter 3 at the substation A. Now, however, when the operator at station A is through talking, and listens to the return conversation, he receives said return conversation in the receiver, which is bridged directly across the conductors 1 and 2, the secondary winding 6 having been short-circuited by the springs 9 and 10. Then when talking into the transmitter 3 at the substation A, the operator presses the button 8, which again cuts the secondary coil 6 in circuit. It will thus be seen that I am entitled to reap the advantages of a high resistance secondary winding, and to offset its disadvantages. By this arrangement I get very excellent results over the high resistance circuits to which I have applied my invention.

In the arrangements at station B I again use the transmitter 3, battery 4 and primary winding 5, likewise the receiver 7 and the secondary winding 6, but I so arrange them that in pressing the button 11 the spring 9 includes the secondary winding 6 in circuit, and the spring 10 at the same time relieves the shunt which is placed around said secondary winding.

The arrangement at station C is similar, excepting that I find it of advantage to include a condenser 12 in the shunt which is placed around the secondary winding, thus to prevent any direct battery current or telegraph currents from passing directly across the line.

Having thus described the preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent is:

1. A telephone transmission system, comprising a line circuit and a plurality of telephone substations, each substation consisting of a transmitter, a battery therefor, a receiver, an induction coil having a primary winding associated with the transmitter and a secondary winding associated with the receiver, and a switch operable independently of any circuit changes in the transmitter circuit for periodically placing a shunt circuit about said secondary winding, and opening the circuit through said secondary winding, so that telephonic currents may pass unhampered through the associated receiver.

2. A telephone transmission system, comprising a line circuit and a plurality of telephone substations, each substation consisting of a transmitter, a battery therefor, a receiver, an induction coil having a primary winding associated with the transmitter and a secondary winding associated with the receiver, a switch operable independently of any circuit changes in the transmitter circuit for periodically placing a shunt circuit about said secondary winding, and opening the circuit through said secondary winding, so that telephonic currents may pass unhampered through the associated receiver, and a condenser included in said shunt circuit.

3. A telephone transmission system comprising a line circuit and a plurality of telephone substations, each substation consisting of a transmitter, a battery therefor, a receiver, an induction coil having a primary winding associated with the transmitter and a high resistance secondary winding associated with the receiver, and a switch operable independently of any circuit changes in the transmitter circuit for periodically placing a shunt circuit about said secondary winding and opening the circuit through said secondary winding, so that telephonic currents may pass unhampered through the associated receiver.

4. A telephone transmission system, comprising a line circuit and a plurality of telephone substations, each substation consisting of a transmitter, a battery therefor, a receiver, an induction coil having a primary winding associated with the transmitter and a high resistance secondary winding associated with the receiver, a switch operable independently of any circuit changes in the transmitter circuit for periodically placing a shunt circuit about said secondary winding, and opening the circuit through said secondary winding, so that telephonic currents may pass unhampered through the associated receiver, and a condenser included in said shunt circuit.

5. A telephone transmission system, comprising a line circuit and a plurality of telephone substations, each substation consisting of a transmitter, a battery therefor, a receiver, an induction coil having a primary winding associated with the transmitter and a high resistance secondary winding associated with the receiver, said high resistance secondary preventing efficient reception of voice currents by said receiver when in circuit therewith, said receiver and secondary winding being normally in bridge of the line circuit, a switch for periodically placing a shunt circuit about said secondary winding, so that telephonic currents may pass unhampered through the associated receiver, and a condenser included in said shunt circuit.

In witness whereof, I hereunto subscribe my name this 4 day of December A. D., 1908.

OTTO T. LADEMAN.

Witnesses:
MAX W. ZABEL,
E. B. CAMPBELL.