W. A. FRICKE.

TELEPHONE TRANSMISSION SYSTEM.

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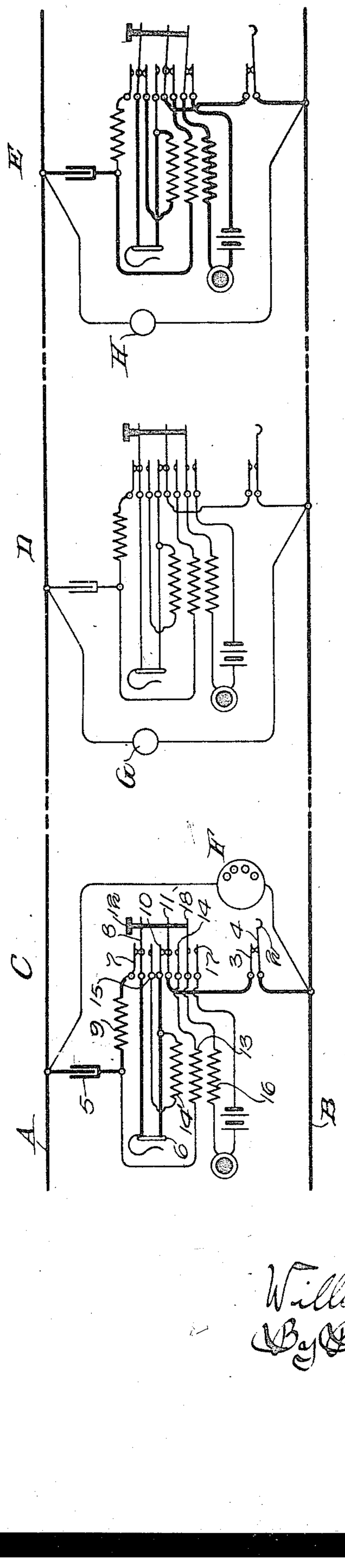
1,209,279. Patented Dec. 19, 1916.



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TELEPHONE TRANSMISSION SYSTEM.

1,209,279. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed March 17, 1913. Serial No. 754,853.

To all whom it may concern:

Be it known that I, WILLIAM A. FRICKE, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Telephone Transmission Systems, of which the following is a specification.

My invention relates to telephone systems, and more particularly to a system adapted for railroad despatch work in which a plurality of stations is associated with a single line.

One of the objects of my invention is to provide an improved arrangement of the substation circuits whereby a conversation may be carried on between two subscribers in a very efficient manner.

A further feature comprises the provision of means for providing a path for incoming voice currents as well as for outgoing voice currents, and means for preventing the outgoing voice currents being shunted through the receiver of the calling station.

These and other features of my invention will be more readily understood by reference to the accompanying drawing, which represents diagrammatically a telephone line with three subscribers' stations bridged across the same.

In accordance with my invention, each substation on the line is bridged across the line wires. One side of the station circuit is connected to one side of the line through a condenser, whereas the other side of the station is connected to the other side of the line through a contact controlled at the switch hook, which contact is normally open. Between these two points there is located the substation equipment, which is divided into two branches, one branch containing a receiver and the other branch containing the secondary winding of the induction coil. In series with the primary winding in a local circuit there is contained a transmitter and a battery for energizing the same. The said induction coil is provided with a tertiary winding, which winding is at times adapted to be included in a local circuit with the receiver, during which times the receiver is completely disconnected from direct connection with the line wires. Associated with one of the stations, of which one may be considered a train despatcher's station, there is provided a suitable impulse-transmitting device for operating the signals at the other stations on the line and in connection with said other stations there is provided a device responsive to said impulse transmitter for controlling the signal at the station with which it is associated. Such impulse-sending and impulse-receiving devices are well known and form no feature of my present invention.

In the accompanying drawing there are shown the line wires A and B across which the several stations C, D, E, etc., are bridged. At F (station C) there is indicated the signal-transmitting device for operating the signal-receiving instruments G and H, etc., at the other stations. All other apparatus at the station C besides the signaling device F is the same as all other apparatus at the other stations, except the signal-receiving device, so that a description of one of the substations will suffice for all. It will be observed that the connection between the station apparatus and the line B is controlled by the switch hook 2 through the contacts 3 and 4. The connection to the other side of the line, it will be seen, is completed through the condenser 5. Normally—that is, when the apparatus is not in use—the receiver 6 is connected with the condenser 5 through the springs 7 and 8 and through the non-inductive resistance 9 on one side, and through the springs 10 and 11 with the spring 3 controlled by the switch hook on the other side. It will therefore be seen that if the receiver is removed from the hook a circuit is established through the station C from the conductor A, through the condenser 5, non-inductive resistance 9, springs 7 and 8, receiver 6, springs 10 and 11 and through the springs 3 and 4 to the other side of the line B. This is the condition of the apparatus when the instrument is in condition for listening.

In order to put the instrument in condition for talking—that is, for transmitting voice currents to the lines A and B—a button 12 is pressed, with the result that the circuit is opened at the springs 7 and 8 and also at the springs 10 and 11, thus disconnecting the receiver 6 completely from both sides of the line. However, a new circuit is closed through the instrument from the line wire A, through the condenser 5 and the secondary winding 13 of the induction coil,

through the springs 14 and 11 to the other side of the line by the closure of contact between the springs 11 and 14 as a result of the pressing of the button. It will be observed that at the same time this new circuit is closed the receiver 6, which was disconnected from across the line conductors A and B, is thrown into a local circuit including the tertiary winding 14′ by the closure of connection between the springs 8 and 15. It will be observed further that at the same time the energizing circuit through the primary winding 16 is established by the closure of connection between the springs 17 and 18. Under this new condition voice currents may be transmitted to the line for affecting the receivers at the other stations. Although the receiver has been disconnected from the other branch to prevent the shunting of the talking currents therethrough, it has been inductively connected with the line in the new local circuit. This permits anyone who has been talking to listen and determine if the party to whom he is talking is himself talking, without seriously affecting the transmission over the line.

The resistance 9, which is in series with the receiver, offers sufficient impedance to voice currents so that if one or more receivers are left down at the substations, thereby placing one or more shunts across the line, these shunts will have sufficient resistance to prevent these shunts rendering the telephone line inoperative.

While I have illustrated and described one particular embodiment of my invention, it is to be understood, of course, that I do not limit myself to the particular construction shown and described.

What I claim as my invention is:—

1. In a telephone system, a metallic line circuit, a bridge across said circuit, said bridge including a pair of branches, a winding of an induction coil connected with one of said branches, a telephone transmitter in a local circuit inductively associated with said winding, a receiver connected in the other branch, a switch for disconnecting said receiver from the path of voice currents passing through said winding, a tertiary winding for said induction coil, and means for including said tertiary winding in series with said receiver.

2. In a telephone system, a metallic line circuit, a bridge across said line circuit, said bridge including a condenser and a hook switch, a pair of parallel connections between said condenser and switch, one of said parallel connections including a winding of an induction coil, a transmitter in a local circuit inductively associated with said winding, a receiver in the other branch, and a switch normally maintaining the branch through said receiver closed and the branch through the winding of the induction coil open, said switch adapted when operated to open the normally closed branch and close the normally open branch, whereby said receiver is removed from the path of voice currents passing through said winding, a tertiary winding for said induction coil, normally open connections from said tertiary winding to said receiver, and a switch for closing said normally open connection.

3. In a telephone system, a metallic line circuit, a bridge across said circuit, said bridge including a condenser and a pair of parallel branch connections, a transmitter operatively associated with one of said branches. a receiver operatively connected in the other of said branches, a multiple switch maintaining said transmitter branch normally open and said receiver branch normally closed, means whereby said switch upon operating closes said transmitter branch and opens said receiver branch on both sides of said receiver, a normally open local circuit for said receiver inductively related to said transmitter, and means whereby said multiple switch when operated closes said local circuit.

4. In a telephone system, a metallic line circuit, a bridge across said circuit, said bridge including a condenser and a hook switch, connections between the same including two parallel branches, a winding of an induction coil in one of said branches, a transmitter inductively associated with said winding, a receiver connected in the other of said branches, a multiple switch maintaining said receiver branch normally closed and said transmitter branch normally open, means whereby said switch upon operating closes said transmitter branch and opens said receiver branch on both sides of said receiver, and a tertiary winding for said induction coil, said tertiary winding being included in a normally open local circuit in said receiver, said local circuit adapted to be closed by the operation of said multiple switch.

Signed by me at Chicago, Cook county, Illinois, this 5 day of March, 1913.

WILLIAM A. FRICKE.

Witnesses:
ARTHUR J. RAY,
EDWARD D. FALES.