O. T. LADEMANN.

TELEGRAPH AND TELEPHONE SYSTEM.

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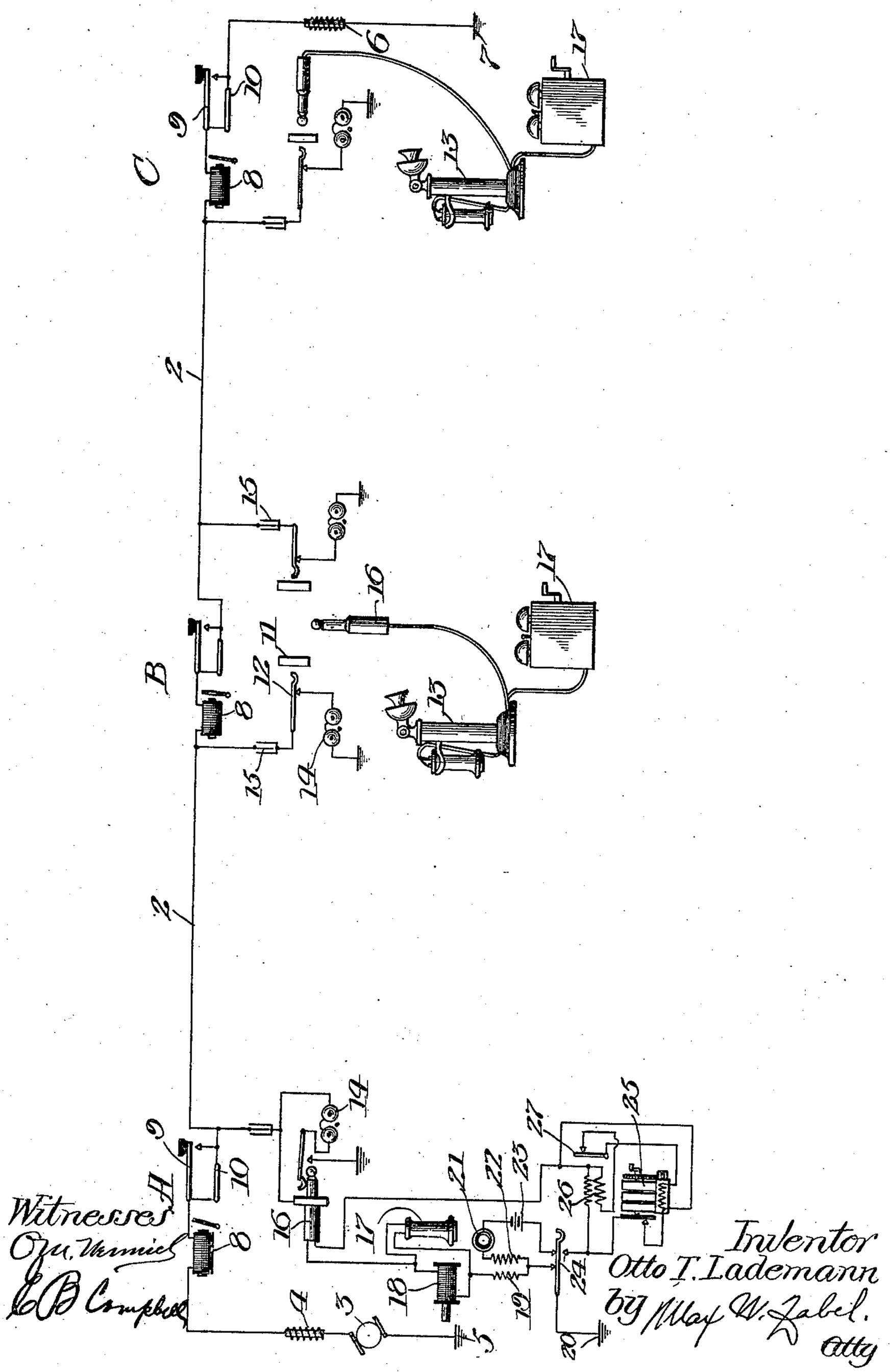
Patented Mar. 21, 1911.



UNITED STATES PATENT OFFICE.

OTTO T. LADEMANN, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO RAILWAY TELEPHONE & ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TELEGRAPH AND TELEPHONE SYSTEM.

987,582. Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed July 24, 1908. Serial No. 445,281.

To all whom it may concern:

Be it known that I, OTTO T. LADEMANN, 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 Telegraph and Telephone 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 combined telegraph and telephone systems, and has for its object the provision of new and improved appliances for permitting the carrying on of a plurality of conversations over a wire which is being used for telegraphic purposes simultaneously.

More particularly my invention contemplates the provision of means whereby several telephone conversations in tandem along the same wire can be carried on, while at the same time telegraphic communication throughout the length of the wire can be had.

I will describe my invention more in detail by reference to the accompanying drawing illustrating the preferred embodiment thereof.

In this drawing I show a transmission line 2, at one end of which is a direct current generator 3, and an impedance coil 4, one terminal of the generator being connected to the ground at 5 and the other terminal of the transmission line 2 having an impedance coil 6 and being thereafter connected with ground at 7. Telegraph relays 8 of high impedance are disposed at intervals along the line in association with telegraph keys 9, 9 and the necessary short circuiting switches 10. The line 2 thus presents the ordinary form of telegraph line, with the exception that the relays 8 are to have a high enough impedance to prevent operative passage therethrough of telephone currents. I have designated three stations A, B and C along this line.

It is the prime object of my invention to provide means whereby telephone conversations between station B and station A can be carried on and at the same time telephone conversation can be carried on between station B and station C if desired, without interfering with the telegraph service and the telephonic appliances being so constructed that the telegraphic current will not injuriously influence said telephonic conversation. In the drawing, however, only one substation set is shown at each substation, so that the conversations in opposite directions are not carried on simultaneously unless a second substation set should be provided.

In the specific arrangement shown in the drawing, I provide jacks having ferrules 11 and contact springs 12, by virtue of which connection is to be made between the telephone 13 and the line wire. It will be observed that other appliances than jacks will accomplish the same result. The jack spring 12 is connected with the high frequency ringer 14 to ground. A condenser 15 is included in each branch which connects the telephonic appliances with the line wire 2 to prevent interference from telegraphic currents.

In association with each telephone there is a plug 16 adapted to be inserted in the right-hand or left-hand jack at either station as desired, likewise a generator box 17.

The telephone circuit which I have preferred to utilize is more clearly shown in connection with station A, wherein the plug 16 has one conductor thereof passing through the telephone receiver 17 which is shunted by a variable impedance coil 18 and from here the talking currents pass through the primary 19 of the inductance coil to ground 20.

The transmitter circuit consists of the transmitter 21, the secondary 22 of the induction coil, and battery 23. A switch-hook lever 24 is shown. From this it will be seen that when the telephone at station A is plugged into the jack and the telephone at station B is plugged into the left-hand jack, conversation can be carried on over this portion of the line wire 2 and will not transmit talking current either to the right of station B or the left of station A, on account of the impedance due to the relay 8. Similarly at the same time a telephone conversation can be carried on on that portion of line 2 which lies between stations B and C. The calling devices in connection with each telephone comprise a generator 25, and an induction coil 26, which generates high frequency current from the generator 25 through the agency of its vibratory armature 27, which high frequency calling circuit is adapted to

influence and operate the signal receiving devices 14.

It will thus be seen that several telephone circuits in tandem can be established throughout the line wire 2, which simultaneous talking circuits will not interfere on account of the impedance of the relays 8, and at the same time telegraphic signals can be transmitted over said line wire 2, which will not injuriously influence the talking current nor disrupt the talking circuit.

While I have herein shown and particularly described the preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent is:

1. A combined telegraph and telephone system having stations and a line circuit connecting them, a telegraph relay at each station, portions of said line circuit intermediate of said relays being adapted for telephonic purposes, said relays serving to prevent telephonic interference between adjoining portions of said line circuit, a telephone at each station, a plug and jacks for connecting one of said telephones to either one of the incoming ends of the said adjacent portions thus to permit telephone conversation from said telephone along said circuit in either direction away from the corresponding relay, two contact-making means included with each jack, a high frequency signal-receiving device serially included with one contact-making means and ground, both of said contact-making means being connected together to the line circuit, a condenser in series with said contact-making means, a metallic plug, a telephone-receiving and transmitting device adapted for connection with one of the contacts of each said metallic plug and ground, and a signal-sending device adapted for connection with the other contact of each said metallic plug and ground.

2. A combined telegraph and telephone system having stations and a line circuit connecting them, a telegraph relay at each station, portions of said line circuit intermediate of said relays being adapted for telephonic purposes, said relays serving to prevent telephonic interference between adjoining portions of said line circuit, a telephone at each station, a plug and jacks for connecting one of said telephones to either one of the incoming ends of the said adjacent portions thus to permit telephone conversation from said telephone along said circuit in either direction away from the corresponding relay, two contact-making means included with each jack, a high frequency signal-receiving device serially included with one contact-making means and ground, both of said contact-making means being connected together to the line circuit, a condenser in series with said contact-making means, a metallic plug, a telephone receiving and transmitting device adapted for connection with one of the contacts of each said metallic plug and ground, an impedance device in bridge of said telephone receiving devices, and a signal-sending device adapted for connection with the other contact of each said metallic plug and ground.

3. A combined telegraph and telephone system having stations and a line circuit connecting them, a telegraph relay at each station, portions of said line circuit intermediate of said relays being adapted for telephonic purposes, said relays serving to prevent telephonic interference between adjoining portions of said line circuit, a telephone at each station, a plug and jacks for connecting one of said telephones to either one of the incoming ends of the said adjacent portions thus to permit telephone conversation from said telephone along said circuit in either direction away from the corresponding relay, two contact-making means included with each jack, a high frequency signal-receiving device serially included with one contact-making means and ground, both of said contact-making means being connected together to the line circuit, a condenser in series with said contact-making means, a metallic plug, a telephone receiving and transmitting device adapted for connection with one of the contacts of each said metallic plug and ground and a signal sending device adapted for connection with the other contact of each said metallic plug and ground; said signal-sending device comprising a generator, vibratory contact and induction coil.

In witness whereof, I hereunto subscribe my name this 18th day of July A. D., 1908.

O. T. LADEMANN.

Witnesses:
EDWARD A. PHILLIPS,
W. J. ISENRING.