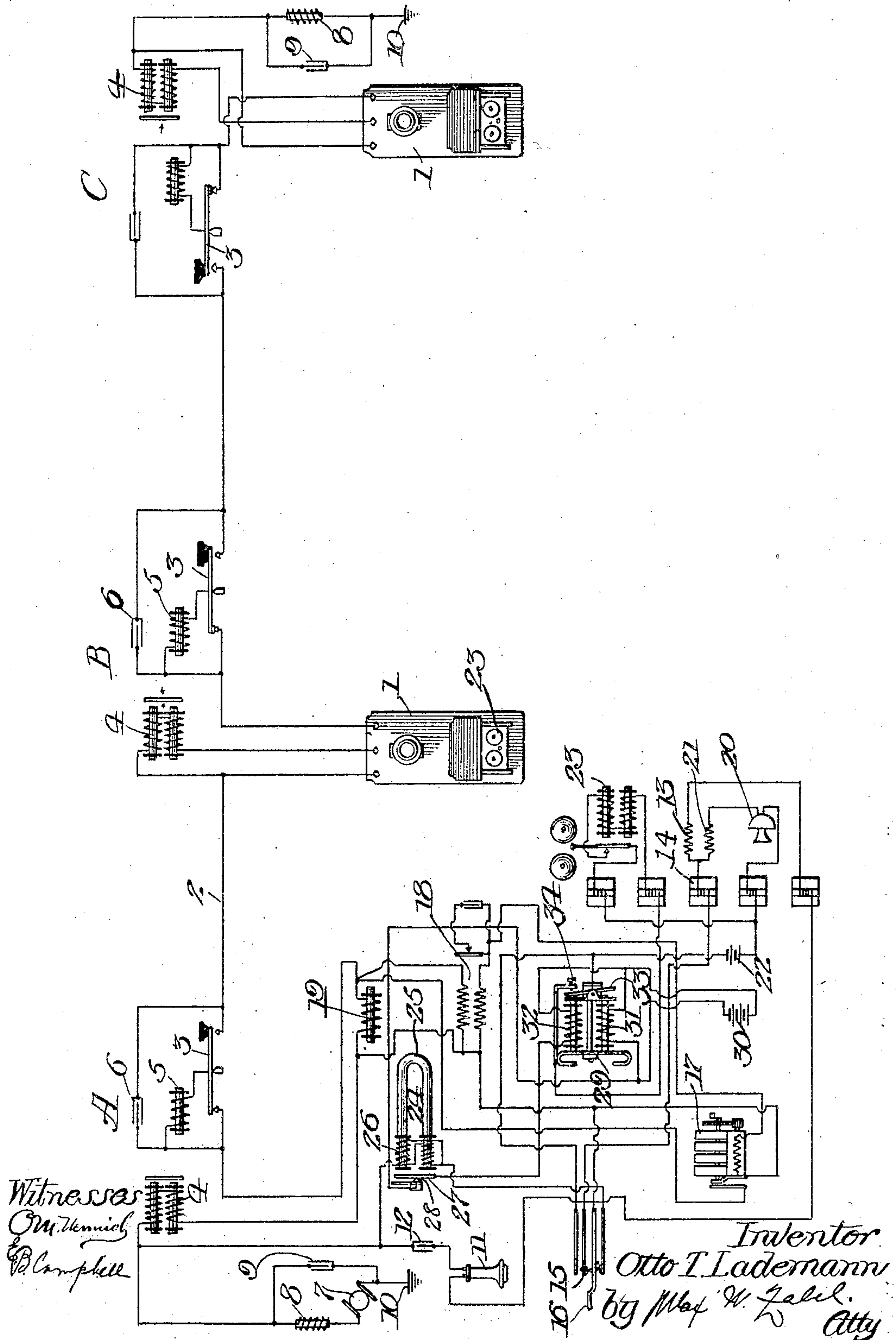


O. T. LADEMAN.  
COMPOSITE TELEPHONE AND TELEGRAPH SYSTEM  
APPLICATION FILED JULY 23, 1908.

956,373.

Patented Apr. 26, 1910.





# UNITED STATES PATENT OFFICE.

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

## COMPOSITE TELEPHONE AND TELEGRAPH SYSTEM.

956,373.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed July 23, 1908. Serial No. 445,004.

*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 Composite Telephone and Telegraph 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 composite systems, and has for its object the provision of an improved telephone circuit for use in connection with such systems, in which improved means are provided for properly calling said telephone on telegraph lines.

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

I have herein shown three stations, A, B and C. At station A I have shown diagrammatically the telephone circuit, and at stations B and C I have merely indicated the telephones 1—1, which have, however, the same circuit as shown diagrammatically in connection with station A. The transmission line 2 unites the various stations A, B and C, and at these various stations there is provided a telegraph key 3, in connection with a sounder 4, and suitable reactive devices 5 and 6, which prevent interference between the telegraph line and the telephone conversation.

One end of the transmission line 2, directly to the left of station A, is provided with a direct current generator 7 and suitable reactive devices 8 and 9, which prevent interference between the telegraphic and telephonic currents. Similar reactive devices 8 and 9 are shown to the right of station C. Ground connections 10—10 are provided at the extremities of the transmission line 2.

The telephone talking circuit, comprising the receiver 11, condenser 12, secondary 13 of the induction coil, hinge connection 14, spring 15 of the switch hook, and spring 16 of the switch-hook, is connected in shunt of the relay 4, so that talking currents are re-

ceived from the line 2 serially by being bridged across the serial relay 4. A generator 17 actuates the signal transmitting induction coil 18, which thereby projects high frequency currents through its secondary winding serially onto the line in shunt of the impedance coil 19. At the same time this generator when turned opens the shunt circuit through the shunt springs of said generator, which shunt springs normally establish a short circuit around the impedance device 19. The transmitter 20, in conjunction with the primary winding 21 and the battery 22, provides talking currents when the switch-hook is in its elevated position. I have found, in operation of systems of this kind, that it is unwise and frequently impracticable and impossible, to operate a local signal 23 directly from current supplied by the transmission line 2, and to this end I provide a peculiarly constructed arrangement of double relays whose inter-action serves to accurately control the operation of said local signal receiving device 23.

The signal receiving circuit includes a relay 24, which is connected in shunt of the telegraph relay 4 when the switch-hook is in its depressed position, but is disconnected therefrom when the receiver is released from the switch-hook. This relay 24 has a permanent magnet 25, and its operating coils 26, in conjunction with a vibratory diaphragm 27, act in conjunction with a weighted contact 28. When a high frequency current is impressed upon the line wire 2, which frequency is too high to actuate the telegraph relay 4, this high frequency current actuates the diaphragm 27 and releases it from its weighted contact 28, which on account of the weight makes it too sluggish to follow synchronously the rapid vibrations of said diaphragm, thus opening the circuit between the diaphragm 27 and the contact 28 to perform circuit changes, the results of which circuit changes will now be set forth in detail:

Armature 27 is connected directly to the windings of an auxiliary relay 29, which relay requires very little current for its operation; in fact, a great deal less than would be required for the signal receiving device



23, and it is very expensive to have a large closed circuit battery merely for operating the signal receiving device 23, with which large closed circuit battery I dispense, as I only need the small closed circuit battery for the operation of the relay 29. A battery 30 of the closed circuit type is connected in closed circuit with the winding 31 of the relay 29, and the winding 32 of the relay 29 is also connected in shunt of the winding 31, but includes serially therewith the armature 27 and weighted contact 28. Thus when the relay 24 is in its normal position, current flows equally through the windings 31 and 32, and the armature is not moved from the position which it occupies in the drawing. Should an actuation of the armature 27, however, take place thus to open the circuit through the winding 32, the armature 33 of the relay 29 is actuated to close circuit with contact 34. The signal receiving device 23 then receives current through the armature 33 and contact 34 from the ordinary form of open circuit battery 22. It is thus seen that in the improved form of the device which I have herein shown, the relay 24 operates the signal receiving device 23 from an open circuit battery, and said relay 24 thus accomplishes the function of calling through the agency of the high frequency circuit the desired station.

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 signaling system having in combination with a signal receiving circuit including a make and break contact signal, a battery therefor, and a relay for controlling the association of said signal with said battery, a closed circuit battery, a normally closed circuit therefor and a signal controlling relay having a weighted vibratory contact for opening when actuated a normally closed circuit including said closed circuit battery, thus to cause an actuation of said signal.

2. A signaling system having in combination with a signal receiving circuit, including a make and break contact signal, a battery therefor, and a relay for controlling the association of said signal with said battery, a closed circuit battery, a normally closed circuit therefor and a signal controlling relay having a weighted vibratory contact for opening when actuated a normally closed circuit, including said closed circuit battery, thus to cause an actuation of said signal through operative action of current from said closed circuit battery upon a circuit established through said battery independently of the contacts of said relay.

3. A signaling system having in combination with a signal receiving circuit, including a make and break contact signal receiv-

ing device, a battery to operate said device, an auxiliary relay to control the operative association of said battery with said device, a signal controlling relay having a vibratory diaphragm and a weighted contact, and means whereby said signal controlling relay causes, when actuated, the operation of said auxiliary relay.

4. A signaling system having in combination with a signal receiving circuit, including a make and break contact signal receiving device, a battery to operate said device, an auxiliary relay to control the operative association of said battery with said device, a signal controlling relay having a vibratory diaphragm, a closed circuit battery associated with said diaphragm and said auxiliary relay, and means whereby said signal controlling relay causes when actuated, the operation of said auxiliary relay.

5. A signaling system having in combination with a signal receiving circuit, including a make and break contact signal receiving device, a battery to operate said device, an auxiliary relay to control the operative association of said battery with said device, a signal controlling relay having a vibratory diaphragm, a closed circuit battery associated with said diaphragm and said auxiliary relay, a contact associated with said diaphragm, and means whereby said signal controlling relay causes, when actuated, the operation of said auxiliary relay.

6. A signaling system having in combination with a signal receiving circuit, including a make and break contact signal receiving device, a battery to operate said device, an auxiliary relay to control the operative association of said battery with said device, a signal controlling relay having a vibratory diaphragm, a closed circuit battery associated with said diaphragm and said auxiliary relay, a weighted contact associated with said diaphragm, and means whereby said signal controlling relay causes, when actuated, the operation of said auxiliary relay.

7. A signaling system having in combination with a signal receiving circuit, including a make and break contact signal receiving device, a battery to operate said device, an auxiliary relay having contacts which control the operative association of said battery with said device, a closed circuit battery having its circuit complete normally through said relay, and a signal controlling relay having contacts maintaining normally a closed circuit between said auxiliary relay and said closed circuit battery, and serving when operated to cause a change in circuit conditions whereby to effect operative actuation of said auxiliary relay by said closed circuit battery through a circuit independent of the contacts of said signal controlling relay aforesaid.

8. A signaling system having in combination with a signal receiving circuit including a vibratory contact signal, a closed circuit battery, a normally closed shunt circuit  
5 around said battery, a signal controlling relay having a weighted vibratory contact for opening when actuated said normally closed shunt circuit around said battery, and means

for operating said signal when said normally closed shunt is opened.

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In witness whereof, I hereunto subscribe my name this 14th day of July A. D., 1908.

O. T. LADEMANN.

Witnesses:

MAX W. ZABEL,  
C. B. CAMPBELL.