

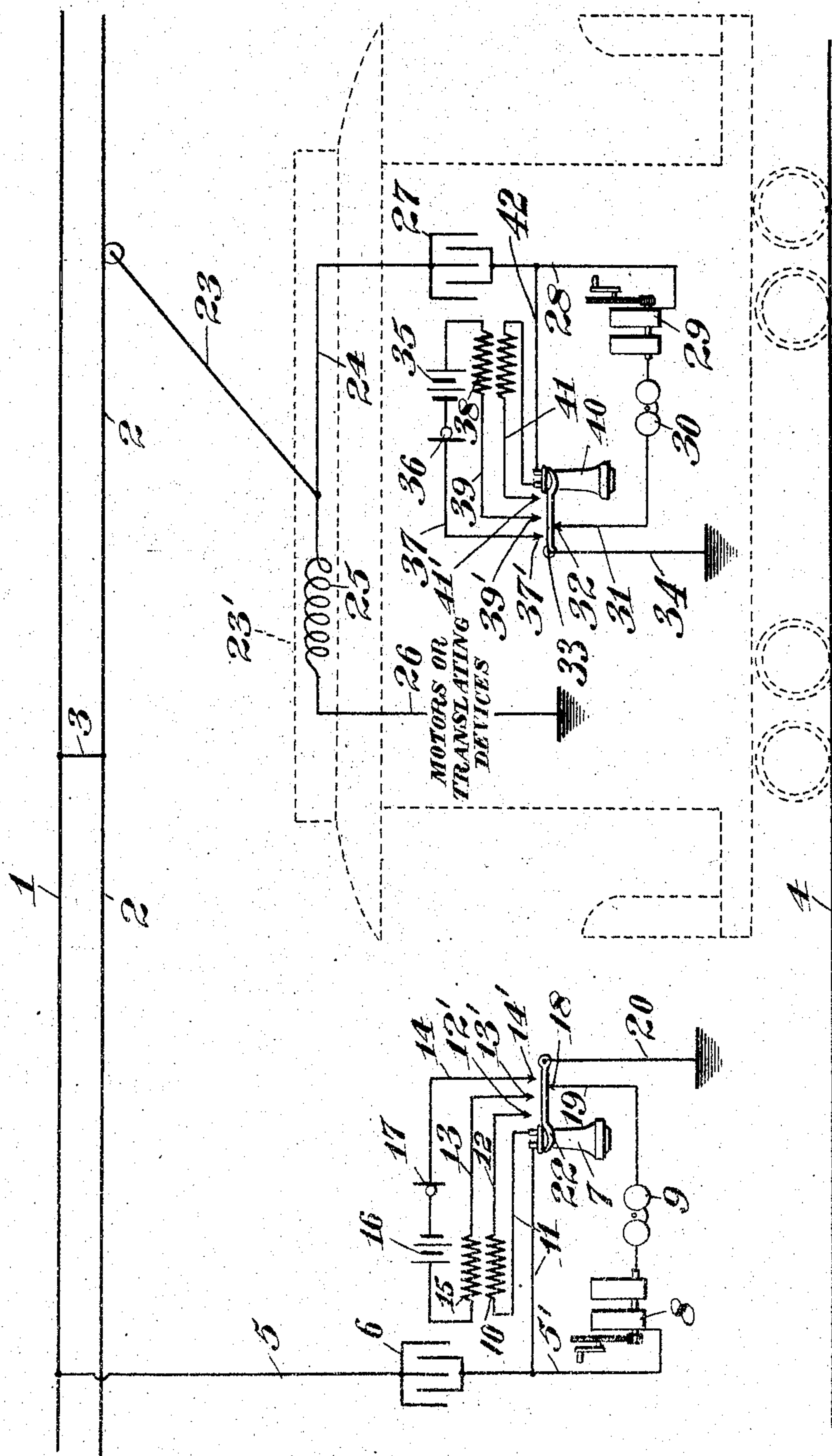
No. 786,925.

PATENTED APR. 11, 1905.

C. R. VAN TRUMP.

MEANS FOR SIGNALING AND TELEPHONING ON ELECTRIC TROLLEY OR OTHER SYSTEMS.

APPLICATION FILED AUG. 4, 1904.



WITNESSES:

Elmer Seavey
Robert Watson

INVENTOR

Charles R. Van Trump

BY

W. E. Schoenborn
Attorney

UNITED STATES PATENT OFFICE.

CHARLES R. VAN TRUMP, OF WILMINGTON, DELAWARE.

MEANS FOR SIGNALING AND TELEPHONING ON ELECTRIC-TROLLEY OR OTHER SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 786,925, dated April 11, 1905.

Application filed August 4, 1904. Serial No. 219,515.

To all whom it may concern:

Be it known that I, CHARLES R. VAN TRUMP, a citizen of the United States, residing at Wilmington, in the county of Newcastle and State of Delaware, have invented certain new and useful Improvements in Means for Signaling and Telephoning on Electric-Trolley or other Systems, of which the following is a specification.

My invention relates generally to that class of signal and telephone systems which transmits a signal or communicates by telephone from one point to another of an electric trolley, third-rail system, electric light or power lines conveying either direct or alternating current.

The object of my invention is to provide an arrangement of devices and relation of circuits with the trolley-lines, third-rail, or other electric motive - power systems whereby a signal or telephone message may be transmitted from one point to any other point over the trolley-line, feeders, or electric conductors used in connection with such systems whether such points be fixed or on moving cars.

The invention consists of such features of construction and relative arrangement of circuits which will be hereinafter more fully and clearly described, and particularly pointed out in the appended claims.

In the accompanying drawing, forming part of this specification, is shown diagrammatically the invention as applied to a section of a trolley-line.

1 indicates the usual feed-wire of a trolley-line.

2 represents the trolley-wire; 3, an auxiliary feed-wire, connecting the feed-wire with the trolley-wire.

4 represents the rails, on which travel the trolley or other form of cars.

5 is a conductor at any point of the system in contact with either the feeder or trolley-wire.

In case of a moving car the conductor 5 may be the trolley-pole in contact with the trolley-wire, as will be hereinafter described in connection with the arrangement and apparatus used for transmitting a message or telephoning from a moving car or train.

6 is a condenser which has one side connected to the conductor 5 and the other side by wire 5' with the receiver 7 and the magneto-machine 8, as is usual in telephone call-stations.

9 represents a call-bell in the circuit of the magneto-machine 8 or other device to produce an alternating, pulsating, or intermittent current for signaling and is grounded or connected to a special return-circuit by means of a wire 19, the usual automatic switch 22, and the wire 20.

The telephone-receiver 7 when not in use is supported on the switch 22 and holds the same in contact with terminal 18 of wire 19, as is commonly provided in this class of inventions.

17 is a telephone-transmitter in the circuit of a local battery 16 and the primary wire 15 of an induction-coil.

The transmitter and primary coil are connected, respectively, to the conductors 14 and 13, having terminals 14' and 13', with which the switch 22 comes in contact when the receiver 7 is removed.

10 is the secondary wire of the induction-coil, having one of its ends connected by wire 11 to the receiver 7 and to the wire 5', leading from one side of the condenser 6. The wire 12 connects the other end of the secondary wire with the terminal 12', with which the switch 22 comes in contact when released, as described.

The arrangement, as described above, may be at any point of an electric-trolley, third-rail, electric light or power system.

23' is a usual trolley car or train, whether moving or standing still, having a trolley-pole 23 in contact with the trolley-wire 2.

25 represents inductance in the conductor 26 and interposed between the motors which propel the car or train or translating devices, such as heaters and lights and their connection with the trolley-pole. Said motors or translating devices of the car may be connected to the ground or separate return-circuit through the wheels to the rails, as is usual in such practice.

24 is a conductor connected with the trolley-pole and with one side of a condenser 27.

28 is a wire connecting the other side of the condenser 27 with the magneto-machine 29 or other device to produce an alternating, pulsating, or intermittent current for signaling, through the call-bell 30, wire 31, to the terminal 32.

33 is an automatic switch which connects the terminal 32 by means of a wire 34 to the wheels of the car, ground, or special return-circuit.

35 is a local battery one pole of which is connected to the transmitter 36 and by means of wire 37 leads to a terminal 37'. The other pole of the battery is connected to the primary wire of the induction-coil 38 and through the wire 39 leads to the terminal 39'.

40 is a receiver which is connected to the wire 28 and one end of the secondary wire of induction-coil 38 by conductor 42. The other end of the secondary wire, by means of conductor 41, ends at terminal 41'.

The receiver 40 is capable of being supported on the switch 33, and said switch when released will be capable of making electric communication with each of terminals 37', 39', and 41'.

The operation of the invention is as follows: If the apparatus is not being used for the transmission of a signal or message, the different parts comprising the invention are in the relations and positions as indicated in the drawing. When it is desired to transmit a message from the moving or fixed car which is at any point on the line comprising the system, one turns the magneto-machine or other expedient, whereby a pulsating, alternating, or intermittent current is made to follow the path from ground or special return-circuit through conductor 34, switch 33, terminal 32, wire 31, call-bell or signal 30, magneto-machine 29, condenser 27, wire 24, trolley-pole 23, trolley 2, auxiliary feeder 3, feeder 1, conductor 5, condenser 6, wire 5', through magneto-machine 8, energizing the signal or call-bell 9 by passing through wire 19, terminal 18, switch 22, conductor 20, to ground or special return-circuit. After the call-bell or other equivalent signal means has given the signal the receivers 40 and 7 are lifted by the despatches from the automatic switches 33 and 22, which make electric connections with the terminals 37', 39', and 41' in the car and the terminals 12', 13', and 14' at the station. The releasing of the switches 22 and 33 throws out of circuit the magneto-machines and call-bells or signal devices and throws in the transmitter and receiver at each point to be communicated with through the condensers and circuits, which can be readily traced in the drawing and fully understood from the above description of the construction and operation by those familiar with the installation and operation of telephone systems and will not require further explanation.

From the foregoing disclosure it will be

readily seen that there are many other applications of this invention outside of the specific use to a trolley-line as herein described—as, for example, the invention may be applied to various electric light and power systems or on electric railways of the third-rail type. It will also be noticed that the construction and relation of the parts in the moving car or train are substantially the same as those described in connection with the fixed point or station with the exception that there are the additional circuit and inductance connecting the motors or translating devices with the trolley pole or shoe.

It can be readily seen that the invention will operate the same if the arrangement as illustrated and described in the moving car be distributed along the line, as well as that described in connection with the fixed points, and thereby enabling one moving train or car communicating with any other car or with a fixed or despatching station.

Various changes may be made in the details of the system, and while I have in the foregoing described specifically one form of apparatus and one system of wiring adapted to accomplish the result aimed at yet it will be obvious to those skilled in the art that the details may be modified in many ways without changing in any way the operation of the apparatus or departing from my invention—as, for example, instead of the magneto-machines indicated in the drawing for the production of the signal-current I may use induction-coils producing a single fluctuation, kick-coils, or other apparatus—as, for instance, a revolving pole-changer or reversing-switch in connection with the condenser so arranged to charge and discharge the latter from the line or trolley, thereby producing fluctuations of current which act similarly upon the signaling apparatus, as shown and described.

It can be readily seen in the application of this invention to alternating-current systems it is only necessary to interpose between the alternating-current generators the lights stationary motors, or any circuit leading to the ground and the feed wires of the system a suitable form of inductance to prevent the current from going to the ground instead of through the proper circuits to or from the signal devices. It will also be required in adapting my invention to alternating-current systems to substitute for the condensers shown in the drawing and referred to in the specification condensers which are so designed and adapted to the frequencies of the alternating current employed and thought not to require further showing or description, as such forms of condensers are readily understood by those skilled in the art.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. A signaling apparatus for electric power

or trolley lines, comprising a conductor for the transmission of direct-current electrical energy, a plurality of signal-stations, an electrical connection between each station and the conductor, a condenser in the circuit of each electrical connection and interposed between the station and conductor, and means at each station for transmitting and receiving an independent signal-current through said conductor, electrical connections and condensers.

2. A telephone apparatus for electric power or trolley lines, comprising a conductor for the transmission of direct-current electrical energy, a plurality of telephone-stations, an electric connection between each station and the conductor, a condenser in the circuit of each electrical connection and interposed between the station and the conductor, and means at each station for receiving and transmitting an independent telephonic current through said conductor, electrical connections and condensers.

3. A telephone apparatus for electric power or trolley lines, comprising a conductor for the transmission of direct-current electrical energy, a plurality of telephone-stations, an electric connection between each station and the conductor, a condenser in the circuit of each electrical connection and interposed between the station and the conductor, means at each station for generating and conveying a signal-current over the conductor, and means at each station for transmitting and receiving an independent telephonic current through said conductor, electrical connections and condensers from one station to any other.

4. A telephone apparatus for electric railways or the like, comprising a trolley-wire or conductor conveying the direct current for propelling the cars, a plurality of telephone-stations, an electrical connection between each station and the trolley-wire or conductor, a condenser in the circuit of each electrical connection and interposed between the station and the trolley-wire or conductor, means at each station for transmitting and receiving an independent telephonic current through the trolley-wire or conductor, a trolley-car having electrical connection with the trolley-wire or conductor, means on the car for transmitting and receiving an independent telephonic current over said trolley-wire or conductor, and a condenser interposed in the circuit of the electrical connection between the transmitting and receiving means of the car and the trolley-wire or conductor.

5. A telephone apparatus for electric railways or the like, comprising a trolley-wire or conductor conveying the direct current for propelling the cars, a plurality of telephone-stations, an electrical connection between each station and the trolley-wire or conductor, a condenser in the circuit of each electrical connection and interposed between the station and the trolley-wire or conductor, means at each

station for transmitting and receiving an independent telephonic current through the trolley-wire or conductor, a trolley-car having electrical connection with the trolley-wire or conductor, motors on said car, electrical connections between the trolley-wire or conductor and the motors, inductance in the said connection and interposed between the motors and the trolley-wire or conductor, means on the car for transmitting and receiving an independent telephonic current over said trolley-wire or conductor, and a condenser interposed in the circuit of the electrical connection between the transmitting and receiving means of the car and the trolley-wire or conductor.

6. A telephone apparatus for electric railways or the like, comprising a trolley-wire or conductor conveying the direct current for propelling the cars or trains, a plurality of independent cars or trains, electrical connections between the trolley-wire or conductor and the cars or trains, motors on said cars or trains, motor-circuits connecting the motors to the electrical connections between the cars or trains and the trolley-wire or conductor, inductance in each of the motor-circuits, means on the cars or trains for transmitting and receiving an independent telephonic current over trolley-wire or conductor, an electric connection between each of the said transmitting and receiving means and the said connection with the trolley-wire or conductor, and a condenser interposed in the telephone-circuit between the transmitting and receiving means of each car and the connection with the trolley-wire or conductor.

7. A telephone apparatus for electric power or trolley lines, comprising a conductor for the transmission of direct-current electrical energy, a plurality of telephone-stations, an electric connection between each station and the conductor, a condenser in the circuit of each electrical connection and interposed between the station and the conductor, means at each station for generating and conveying a fluctuating signal-current over the conductor comprising a magneto-machine having a commutator of plural sections, and means at each station for transmitting and receiving an independent telephonic current through said conductor, electrical connections and condensers from one station to any other.

8. A signaling apparatus for electric power or trolley lines, comprising a conductor for the transmission of electrical energy, a plurality of signal-stations, an electrical connection between each station and the conductor, a condenser in the circuit of each electrical connection and interposed between the station and conductor, and means at each station for transmitting and receiving an independent signal-current through said conductor, electrical connections and condensers.

9. A telephone apparatus for electric power or trolley lines, comprising a conductor for the

transmission of electrical energy, a plurality of telephone-stations, an electric connection between each station and the conductor, a condenser in the circuit of each electrical connection and interposed between the station and the conductor, and means at each station for receiving and transmitting an independent telephonic current through said conductor, electrical connections and condensers.

10 10. A telephone apparatus for electric power or trolley lines, comprising a conductor for the transmission of electrical energy, a plurality of telephone-stations, an electric connection
15 denser in the circuit of each electrical connec-

tion and interposed between the station and the conductor, means at each station for generating and conveying a signal-current over the conductor, and means at each station for transmitting and receiving an independent 20 telephonic current through said conductor, electrical connections and condensers from one station to any other.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES R. VAN TRUMP.

Witnesses:

THOMAS J. BOWEN, Jr.,

HARRY H. JOHNSON.