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U. KLOSS ET AL

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ELECTRIC TRAMWAY, RAILWAY, AND LIKE SYSTEM

Filed Oct. 23, 1930

2 Sheets-Sheet 1

Fig. 1

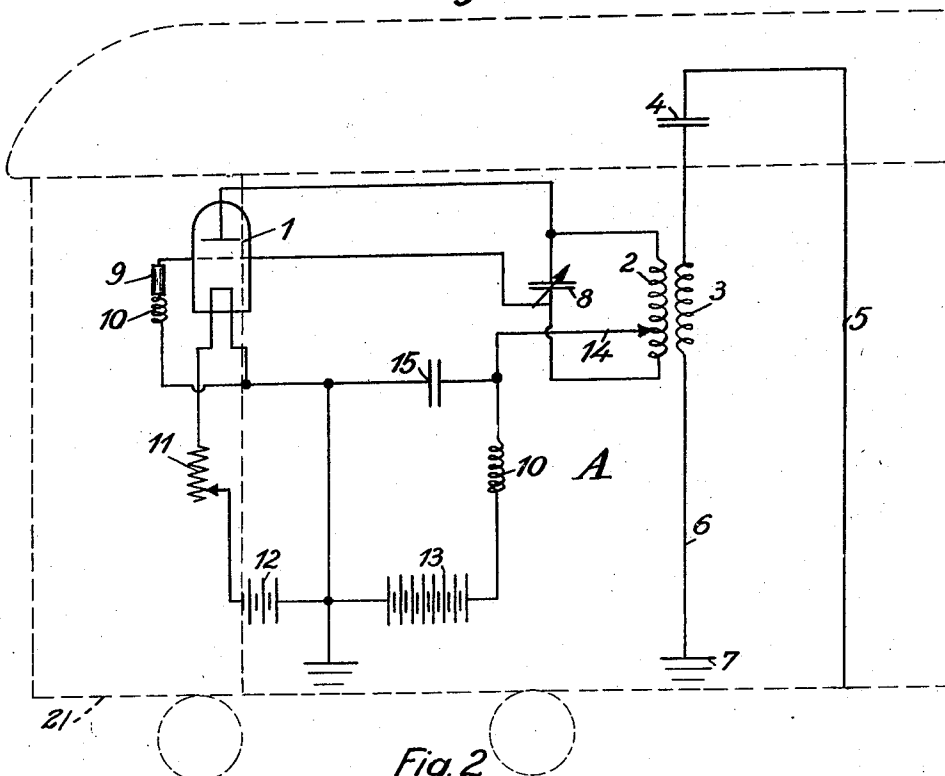
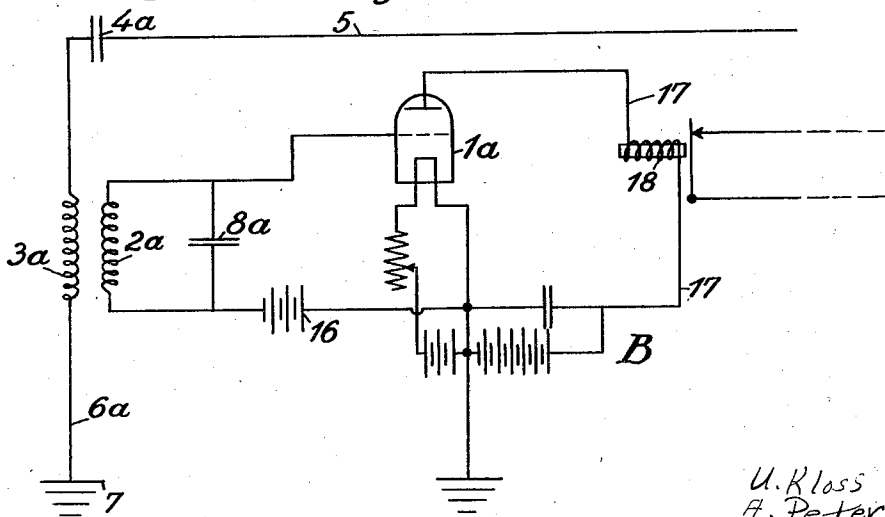


Fig. 2



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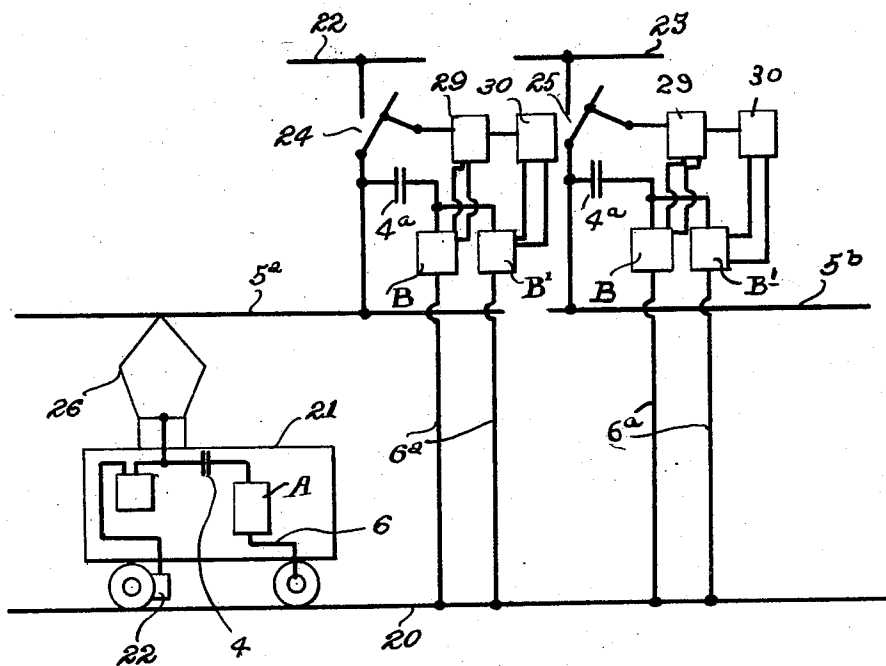


Fig. 3.

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UNITED STATES PATENT OFFICE

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ELECTRIC TRAMWAY, RAILWAY, AND LIKE SYSTEM

Application filed October 23, 1930, Serial No. 490,736, and in Germany September 3, 1929.

The present invention relates to electric railways, tramways and other electrically propelled rail vehicles, and more particularly to a method of electrically connecting or disconnecting from a remote point sections of the track.

For this purpose it has already been proposed to transmit electrical waves of different frequencies along the conductor lines or rails respectively and to control at the substation a tuned receiving apparatus which in turn transmits to the apparatus of the substation the desired actuation.

The known arrangements of this kind are accompanied by the disadvantage that upon disconnecting the substation by reason of a corresponding operation performed on the vehicle or car subsequent reconnection of the substation is impossible, since the source of energy is also cut off which is utilized for generating the electric waves.

It is the primary object of the present invention to eliminate the drawback referred to, and this is accomplished by locating the source of energy employed for generating the electric waves on the car or vehicle itself, so that the same is wholly independent of the rail or line current as the case may be.

Other objects and advantages of the invention will become apparent as the description proceeds.

The invention will now be described more fully with reference to the accompanying drawings, which serves for the diagrammatical representation thereof.

Fig. 1 is a circuit diagram for the transmitter provided on the vehicle.

Fig. 2 is the circuit diagram in respect of the receiver located at the sub-station.

The transmitter designated generally at A carried on the car 21 comprises a transmitter tube 1, the usual oscillatory circuit coil 2 and the coupling coil 3, which is connected on the one hand with the interposition of a block condenser 4 to the conductor line trolley wire 5, and on the other hand, through the medium of the line 6, with earth 7, as, in this case with the rail 20 through the car wheels and axle. 8 is a tuning condenser serving to complete the adjustable oscillatory

circuit, while 9 is the usual high ohmic resistance and 10 the choke coils. 11 is a regulating resistance connected to the heating battery 12, the anode battery being designated by 13. The oscillatory circuit coil communicates in the usual manner with a tapping line 14, and across the cathode line there is also connected an additional block condenser 15. In lieu of the tube transmitter as described above it is also possible to employ a high frequency generator in order to be able to transmit to the sub-stations through the medium of the trolley wire 5 or rail 20 waves of desired length.

Referring to Fig. 2, the receiving apparatus designated at B is connected, with the coupling coil 3a, to the rail 20 through the medium of the line 6a, while the second terminal of the coupling coil is connected through the medium of the block condenser 4a, with the conductor line or trolley wire 5. The oscillatory circuit coil is designated 2a, while 8a is a tuning condenser. The detector tube 1a is, with the use of a heating battery, an anode battery and also a special grid battery 16, connected in the usual manner across the oscillatory circuit. In the output circuit 17 of this receiver there is located a relay 18, which acts upon the circuit to disconnect an oil switch as will be herein after more fully described. The input or output circuit may naturally be provided with one or more amplifying tubes in order to ensure proper response on the part of the relay.

The current for operating the driving motor 22 of the car 21 is supplied, on the one hand, by the rail 20 and, on the other hand, by the trolley wire 5 which, as shown in Fig. 3, is divided into two sections 5a and 5b. Feed lines 22 and 23 are connected with the sections 5a and 5b through control switches 24 and 25. Within the car 21 is positioned the transmitter A illustrated in detail in Fig. 1 which, with the car in the position shown in Fig. 3, is connected with the section 5a by the usual shoe 26 through the condenser 4. The transmitter A is also connected to the track rail 20 by the conductor 6 and the car wheel and axle. Re-

ceivers B and B' constructed in accordance with the one illustrated in detail in Fig. 2 are located in the substation and are connected, on the one hand, with the trolley wire 5a and on the other with the track rail 20. The two receivers, however, are tuned to different frequencies and they operate, respectively, relays 29 and 30 which are connected with and operate to open and close the switch 24 of the feed conductor 22. Thus, when the receiver B is operated by transmission of high frequency energy of the proper characteristic from the transmitter A, the relay 29 is operated to open the switch 24 whereas, when the receiver B' is operated by high frequency energy of proper characteristic transmitted by the transmitter A, the relay 30 is caused to close the switch. In this manner the two receivers B and B' may be selectively operated from the transmitter A carried on the electric car 21. When the car 21 passes from the trolley section 5a to the section 5b the connection of the latter section with the feed conductor 23 is controlled by two receivers identical with those above described.

It will be understood that no restriction is made to the specific form of embodiment described with reference to the drawing, and that various modifications are quite possible without departing from the spirit of the invention.

What we claim as new and desire to secure by Letters Patent is:

1. In an electric railway, power circuit conductors, adapted to supply electric energy for the operation of electric cars, means for transmitting currents of different characteristics over said conductors, a plurality of selective means operated in response to the transmission of currents of different characteristics for controlling the supply of energy to the power circuit conductors.

2. In an electric railway, power circuit conductors adapted to supply electric energy for the operation of electric cars, means for transmitting currents of different characteristics over said conductors, a plurality of selective means operated in response to the transmission of currents of different characteristics for controlling the power circuit conductors, one of said selective means operating to open the power circuit conductors to interrupt operation of electric cars and the other selective means operating to close the power circuit conductors and permit normal operation of said cars.

In testimony whereof we have affixed our signatures.

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