

ELECTRIC RAILWAY SYSTEM

Provisional Application For A Patent

Prepared on: 2016-05-15

INVENTORS

Nikola Tesla

ABSTRACT

This invention is an improved system and method for supplying electric current to the motors of street cars or other vehicles from a central power source without the use of sliding or rolling contacts. By avoiding the use of physical electrical contacts, the invention reduces installation and maintenance cost and provides a more reliable way to power electric motors of such vehicles. The invention solves the problem by including an alternating or pulsating power source connected to a conductor to carry the electric power along the line of travel. The conductor is placed in a conduit constructed between or alongside the tracks or rails. A conducting plate connected to the vehicle's electric motors travel along the conduit in close proximity to the conducting line and collects electric power through electrical coupling, without making physical contact with the conducting line.

Title Of The Invention

Electric Railway System

Background Of The Invention

[0001] This invention is an improved system and method for supplying electric current to the motors of street cars or other vehicles from a central power source without the use of sliding or rolling contacts. By avoiding the use of physical electrical contacts, the invention reduces installation and maintenance cost and provides a more reliable way to power electric motors of such vehicles.

[0002] The invention solves the problem by including an alternating or pulsating power source connected to a conductor to carry the electric power along the line of travel. The conductor is placed in a conduit constructed between or alongside the tracks or rails. A conducting plate connected to the vehicle's electric motors travel along the conduit in close proximity to the conducting line and collects electric power through electrical coupling, without making physical contact with the conducting line.

Brief Summary Of The Invention

[0003] Present solutions to the problem of bringing electrical power to street cars and other vehicles involves supplying electrical power along side the line of travel, and sliding or rolling conductors conduct the electric power to the motors of the vehicle. Known methods include physical contacts for transferring electric power to the vehicle's motors.

[0004] Currently known solutions all include sliding or rolling contacts that over time wear out or lose contact because of accumulating dirt or water. This makes the known solutions expensive to install and maintain. Moreover current solutions involve electrical conductors along the tracks or rails that create hazard to people.

[0005] The present invention improves the known solutions by eliminating the need for contacts that physically slide or roll over a conducting line, thereby eliminating the costly maintenance. In addition, by enclosing the conducting line within a conduit, the present invention eliminates electrical hazard to people.

Detailed Description Of The Invention

[0006] The foregoing descriptions, formulations, diagrams, and figures are provided merely as illustrative examples, and they are not intended to require or imply that the steps of the various embodiments must be performed in the order presented or that the components of the invention be arranged in the same manner as presented. The steps in the foregoing descriptions and illustrations may be performed in any order, and components of the invention may be arranged in other ways. Words such as “then,” “next,” etc., are not intended to limit the order of the steps or the arrangement of components; these words are used merely to guide the reader through the description of the invention. Although descriptions and illustrations may describe the operations as a sequential process, one or more of the operations can be performed in parallel or concurrently, or one or more components may be arranged in parallel or sequentially. In addition, the order of the operations may be rearranged.

[0007] The details of the invention and the way it operates will now be described by reference to the drawings included. Figure 1 is a view showing a portion of a rail car and the means for supplying electrical power to the car's motor from a line conductor that is inside a conduit between the rails. Figure 2 is an enlarged sectional view of the conducting arm and the conducting plate that transmits the electrical power to the motor. Figure 3 is an enlarged view of the line conductor.

The preferred way to implement the invention is as follows. In Figure 1, the conduit (11) is made out of iron and includes a vertical slot on top. The conduit (11) is buried between the rails along the line of travel. The opening slot on top of the conduit includes a flange (12) that forms a protected chamber for housing the line conductor. The line conductor should be placed in the center of the chamber to avoid unwanted inductive effects from the sides of the chamber. Figure 1 also shows the rail car with an electric motor (14) which is suitable for the type of electric current being employed, for example alternating current or DC current.

An iron conducting tube (21) connected to the motor or the car is shown in Figure 2. The tube (21) extends into the conduits through the slot in the chamber. The lower end of the conducting tube is curved upwards and a conducting plate (22) is attached to it. This conducting plate is electrically connected to the tube and in turn to the motors of the rail car through an insulated wire (23). It should be understood that all portions of the arm as well as the plate itself may be insulated

by a waterproof covering.

As shown in Figure 3, the line conductor is made from a suitable conducting wire (31) and it includes an insulated coating (32), which is further enclosed in a metallic sheathing (35). The sheathing (35) may be made out of iron and may include lugs (34) and insulated rods (33) to suspend it within the chamber.

To operate the invention, the line conductor (31) is connected to a electrical power source of high potential and high frequency. The electric current can be transmitted to long distances without much dissipation loss since the conducting line is insulated. When the conducting plate (22) is near the conducting line, however, it causes transfer of electrical energy from the conducting line to the plate through condenser action.

[0008] The invention includes several components that work together. First, the invention includes an electric car, such as a street car or other vehicle, that has electric motors mechanically connected to the car's wheels in order to move the car. It also includes a conducting line for carrying electrical power along the travel line of the car. It further includes a conduit within which the electrical conducting line is laid. The car mentioned also includes a conductive plate attached to a conducting arm extending below the car near the conducting line when the car is traveling. In addition, the invention includes a power source for supplying electrical power to the conducting line.

[0009] The power source is a central or stationary supply of electrical power. It supplies electrical current to the conducting line. The electrical power is of high potential and it is alternating or pulsating at a high frequency. This electrical power is carried along the conducting line and it is transferred to the car through electrical coupling between the conducting line and the conductive plate that is near it. The conductive plate collects electric power from the conducting line and transfers it to the conducting arm. The conducting arm is further transfers the electrical power to the electric motors and moves the car. The purpose of the conduit is to protect the conducting line that's laid inside it. Therefore the conducting line is inside a conduit that is buried between or alongside the tracks that the car travels on. This way, the electrical power is transferred to the car, and powers the car, without a physical connection between the conducting line and the car.

[0010] A street car or other vehicle configured to operate according to the current invention is also compatible with other electric rail systems. Operator of

the car first checks to see what type of conducting line is available along the tract. If the rail system is a conventional electric rail, then the conducting plate and the conducting arm are adjusted such that the plate makes physical contact with the electrical line and slides over it. Note that the conducting plate can be replaced with a conducting wheel that can roll over the conventional electrical line also.

[0011] In building a system that works according to this invention, in addition to the usual step of laying rails for the track, the conduit that contains the electrical line conductor must be buried between the rails. When burying the conduit, it is necessary to leave the slot on top of the conduit uncovered so the conducting arm from a rail car can extend into the conduit.

When building the rail car, in addition to the electric motor, a conducting arm and a conducting plate needs to be installed. The plate and the arm should be connected to the electric motor through an insulated conducting wire. The length of the conducting arm is such that it extends into the buried conduit without causing the plate to make physical contact with the line conductor.

[0012] An alternative way of insulating the line conductor is to divide up the conducting sheathing into sections insulated from one another but in an overlapping fashion. This way, if there is unintentional grounding of any one section causes little loss of electric power compared to one where the entire sheathing is grounded.

Above the screen was described as being insulated from the ground but as an alternative it can be connected to the ground through a small capacitance (13) as well, as shown in Figure 1.

[0013] In an alternative implementation, the conducting arm, or the tube, can be straight instead of being curved upwards at the lower end. In this configuration, the conducting plate would be above the line conductor instead of being below it. The line conductor would then be secured inside the conduit by rods below it, instead of being suspended from above.

[0014] When in operation, a rail car receives electrical power from the line conductor through the car's conducting arm and conducting plate by electrical coupling. The motors of the car are therefore powered by the collected electricity. A conductor of the rail car would simply command the rail car in the same manner as one would in conventional rail cars. As an initial step, the conductor

determines if the rail car is on a conventional rail system or a rail system according to this invention, and subsequently adjusts the conducting arm of the car.

[0015] Although the invention was described as it relates to rail cars with electric motors, it is possible to apply the invention to other vehicles that operate on or off tracks. For instance, in roads where automobiles travel, electric lines similar to the line conductor described here can be laid and automobiles can collect electric power from these line conductors as they travel above them.

[0016] In addition to powering the motors of the rail cars or other vehicles, a system as described here can be used to power the electrical appliances, lighting, cooling systems, and other useful devices on board the rail car, or the vehicle.

[0017] The preceding description and illustrations of the disclosed embodiments is provided in order to enable a person skilled in the art to make or use the present invention. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments without departing from the spirit or scope of the invention. Thus, the present invention is not intended to be limited to the embodiments shown herein but is to be accorded the widest scope consistent with the principles and novel features disclosed herein. While various aspects and embodiments have been disclosed, other aspects and embodiments are possible. The various aspects and embodiments disclosed are for purposes of illustration and are not intended to be limiting.

Claims

What is claimed:

1. Electric Railway System

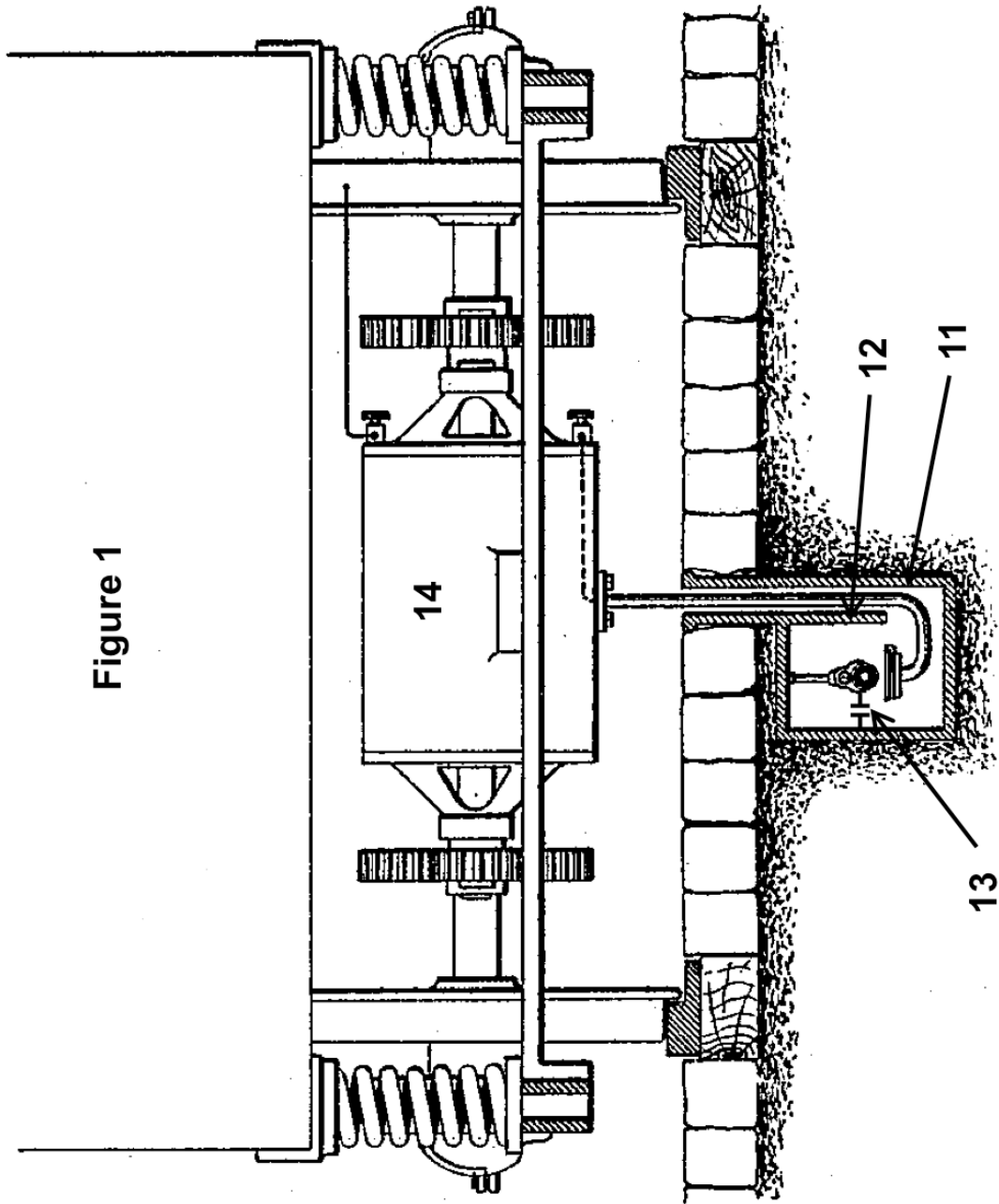


Figure 1

Figure 2

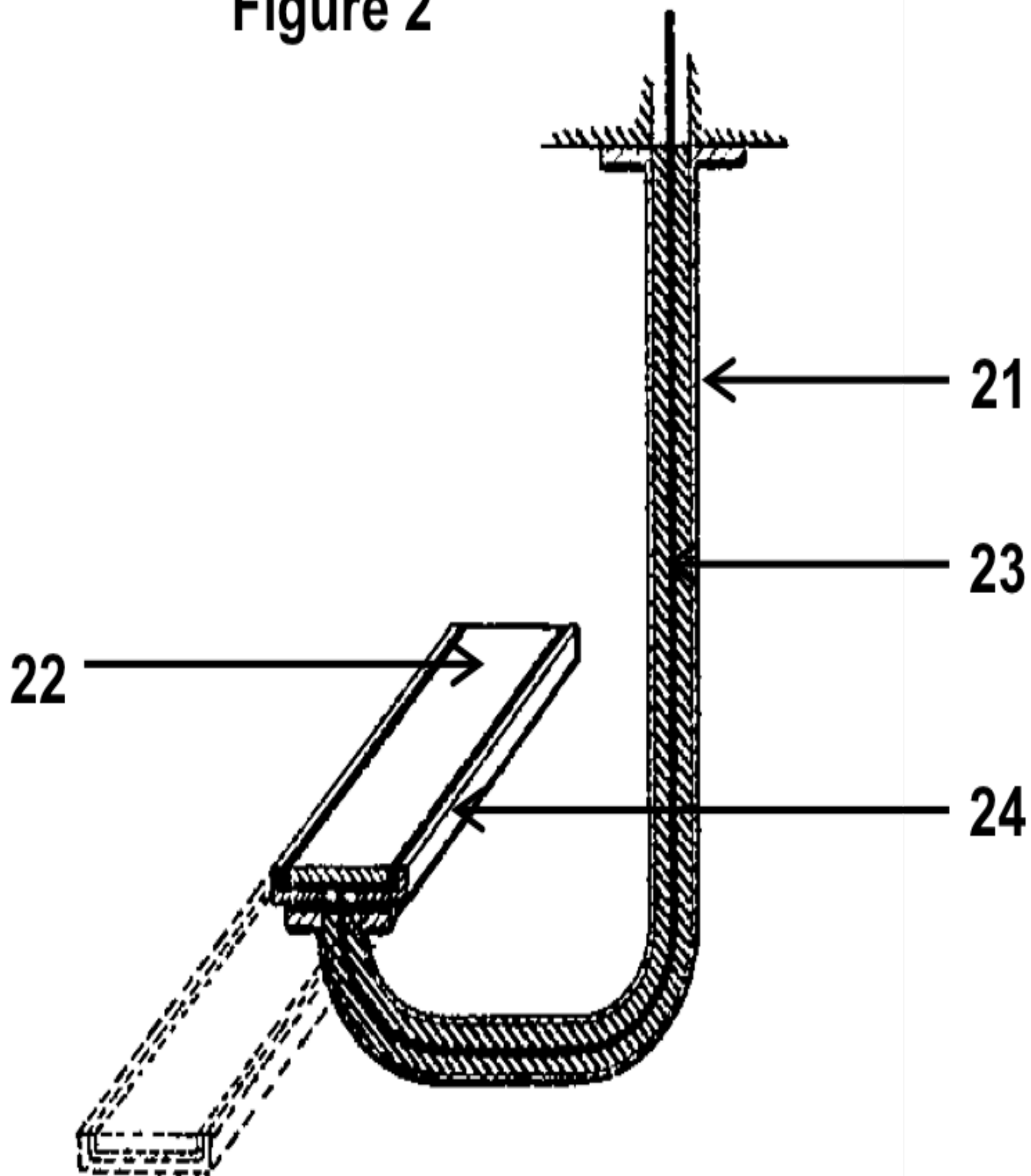


Figure 3

