Electrical Engineering | Technology Offer

Device for Registering the Occupancy of Tracks in Railway Traffic

Technological Challenge

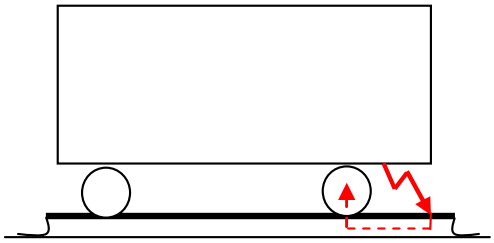
When operating a rail network, it is necessary to establish whether a particular section of the track is free or is occupied by a train. This increases the safety by decreasing the likelihood of collisions. The more precisely and reliably one knows the position of a train, the more the distance between two trains following each other can be reduced. An increase in the frequency of trains leads to a more effective use of the rail network.

Current Status of Technology

A very common method for determining the occupancy of a rail track are the so-called track circuits. This method involves applying a low voltage to a pair of rail tracks which are isolated from the rest of the network and monitoring whether the voltage is short-circuited by the wheels and axles of a passing train. This allows the control of signalling systems. When a short-circuit exists, the track is occupied and a rail traffic control system may for example turn a red light on, while signalling green when there is no train on that segment of the track. Although the wheels and axles of a train carriage can easily produce the necessary short-circuit between the two rails, rust and dirt that may cover the rail surface over time can create significant problems. Such insulating surfaces can prevent the reliable creation of a short-circuit and thus can undermine the safety of the rail traffic.

Innovation

The present invention consists of a device that allows to break through the insulating surface and thus ensures reliable signalling. This is achieved by creating sparks between the carriage wheels and the rails by applying short high voltage impulses which induce a current in the rails and break through the isolating surface film. In this way, the low voltage applied to the pair of rails is reliably short-circuited by the wheels and axles, producing the necessary input into the rail network control system. The device for the production of the sparks (electrodes, controller electricity supply, etc) is mounted on the vehicle (locomotive, railway carriage).



Your Advantages at a Glance:

- No modifications to the track network required
- Even rarely used rail tracks can be used safely
- Can be implemented in cross border traffic
- Low costs
- Simple installation, makes redundancy affordable
- Older railway stock can be easily upgraded
- The components are robust and have been in use for years in other fields (car industry)
- Independent of the electricity network. Electricity supplied by batteries and thus the device is operating normally even when there is a power outage or when the train is stationary.

Patent Portfolio

An European patent was granted (2012) / National Phase in DE, FR and GB

Technology Transfer

The Technologie-Lizenz-Büro GmbH has been charged with the commercialization and now offers companies the opportunity to obtain a license to exploit this new technology.

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