



Electric Power Systems

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THREE PHASE ELECTRICITY



Fig. 1. Dolivo-Dobrovolsky Mikhail Osipovich (12/21/1861, St. Petersburg, RI - 11/15/1919, Heidelberg, Germany) - electrical engineer, developer of three-phase current technology.

The invention of Dolivo-Dobrovolsky laid the foundation for the widespread introduction of the three-phase method in the world.

The three-phase method has a number of advantages. One of them is that the sum of three currents with different phases by 120 degrees is zero. So, three currents next to each other do not radiate energy.

But this method also has disadvantages. For example, there are the following.

For the entire length of the three-phase line, it is necessary to maintain 120 degrees of phase difference between the currents in the wires.

- The distances between the wires must be the same throughout the entire length, so it is difficult to build a three-phase line in real conditions.
- These wires are very expensive.
- Easily damaged, so frequent interruptions in work are possible

- There are many problems when part of the energy needs to be taken in a non-three-phase form.
- Wires can be rich in calcium. Therefore, temperatures can rise on large surfaces.
- The complexity of creating a three-phase system on rough terrain.
- For the entire length of the three-phase line, it is necessary to maintain 120 degrees of phase difference between the currents in the wires.

First Electrical Tram

St. Petersburg [7] - Please where not only three-phase networks are being built, but also the first tram. It was exposed by an engineer.

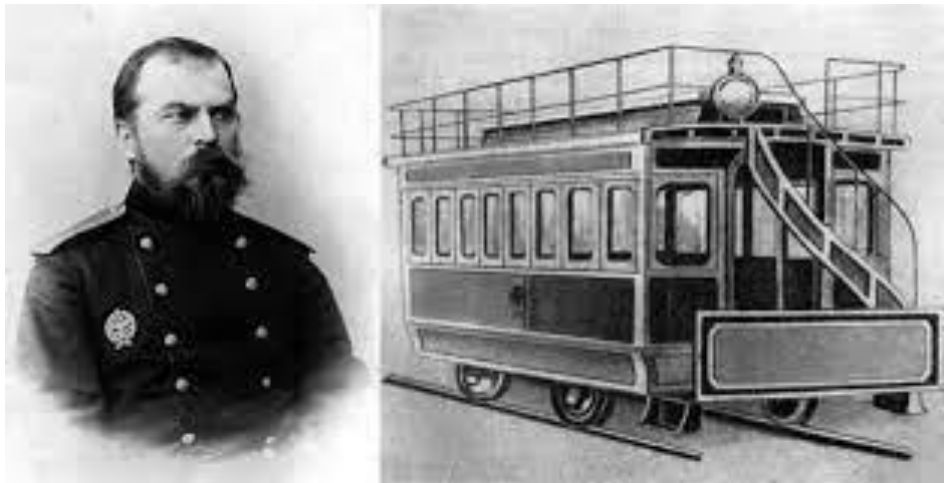


Fig. 2. Paritsky (from Kyiv)- Today, the 600 V AC tram network uses rails for zeroing the potential (Nullifier [5])

ONE WIRE WORLD

One-Wire System

Here a new power transmission scheme based on the single-wire method is proposed. The author got lot objections. For example, an electrical circuit must be closed. But in any book on the study of power supply systems, you can read that active energy does not return from the load to the source. If so, why do we use two wires Instead of one?

One wire system has serial advantages.

- It's much cheaper (In an electrical system, the most expensive part is the wires).
- Does not take up large areas.
- Significantly reduce power outages.
- Does not heat the ground.
- It has electronic synchronization of windmills, which dramatically increases their efficiency.

On fig. 3 shows the results of modeling two-wire and single-wire systems.

With a single-wire system, the current in the common wire will be twice as much, so the wire resistance should be half as much.

Bank M. System for charging electrically drive vehicles with a single line for transmitting electric current from a source to a charging station. **U.S. Patent No. 10,250,061.**

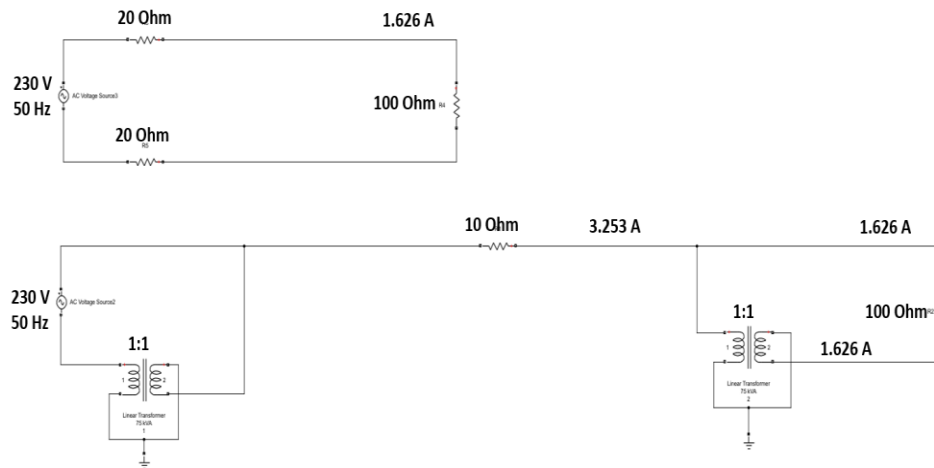


Fig. 3 Two wires and one wire systems simulations results.

This method makes it possible to build more economical electric transport in the city. In these cases, do not necessary using rails for a current transmitting.

One wire method allows transmitting for electrical transport energy using one underground wire only [9] without rails.

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Bank, M. 2023 It is quite Another Electricity, second Addition. Partridge

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