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CURRENT ASPECTS REGARDING CABLE TRANSPORTATION

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Abstract: *The paper presents the types of equipment used to transport cable used to transport goods and for tourist to areas for winter sports, and also to have access in areas where is not possible with other means of transport. It highlights the need for cable carriage.*
Keywords: *cableway, cable, cable transportation*

1. INTRODUCTION

Forest is one of the most important sources of raw material of Romania. Of a particular importance is the careful and systematic harvesting of timber. The production process of wood exploitation must establish the also the technical work and the organization way in the field of harvest and transport of produced wood. The access to forest roads is not quite advanced, thus it must be used a special in order to resolve this problem: the cableway.
Cable transportation is used for quick access to mountains equipped to ski slopes and connects the massives of mountains for tourist attraction. It also represents a means of travel and entertainment, having an important role in the development of mountain tourism (infrastructure tourist altitude resorts), but also for winter tourism.

2. GENERALITIES

The funicular: is a general construction, plumbing and mechanisms that form an air way of transport vehicle with materials and empty which has a supporting way and towing, suspended steel cables ropes on pillars and stops.The name funicular comes from the Latin "funiculus" which means string. In our country, we distinguish by name the funicular railways for material transport, from wood sector, called "funicular", and funicular railways people transport called "lifts."
"Funicular" does not have the same meaning in all countries, in some countries by funicular railway it means that traction using a cable or a rack, for passenger transport, which runs on tracks with high gradients.

Depending on the way of transport are related ground facilities such as inclined planes, and hanging plants free from land, air, such as lifts.

To avoid confusion it is also used as "cableway installation", under sting by this a range of construction, plants and machineries forming a mean of air transport materials and people, using suspended steel cables as a support way and vehicles towing.[3]

3. CLASSIFICATION

Funicular railways, as cable installation can be classified as:

- by destination or type of transport:
  - funiculars materials for forest transportation, mining, building materials;
  - funicular persons or cableway, which by the vehicles type vehicles can be:
    - cable cars where the vehicle consists of a closed cabin with a certain transmission capacity (minimum 10 people), the cable is fixed to the tractor telecabine;

Fig.1 Funicular with mechanically operating [4]

- gondolas, the vehicle consists of a closed cabin with carrying capacity of two or six people with temporary fixture (coupling - Automatic release stations), to the cable or carrier tractor
- lifts, the vehicles have the shape of chairs with one to four places, temporarily or permanently coupled to the cable carrier - tractor;
- lifts, snow skiers moving through their cable tow traction through special devices extensible;
- sleighs loaded with people moving through their cable tow traction through special devices extensible.

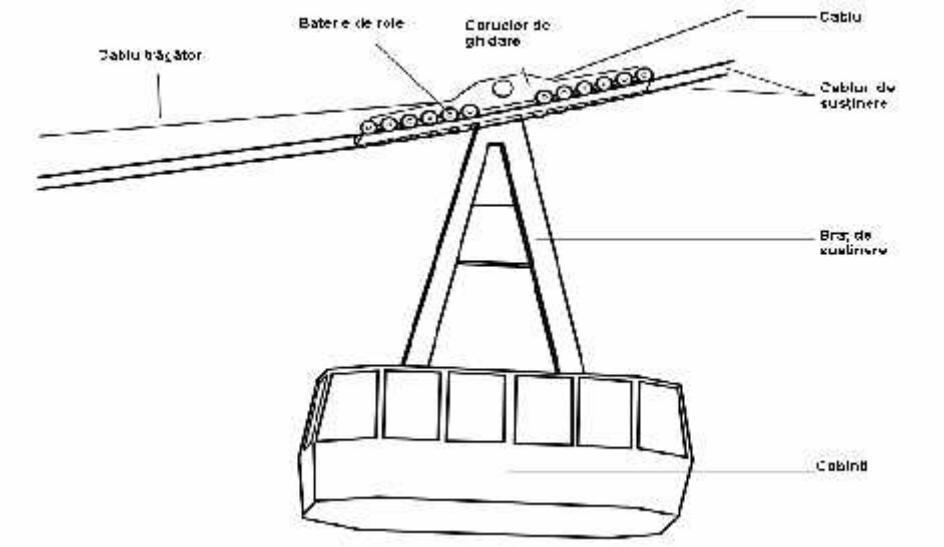

Fig. 2 Components of the cabin [5]

- mix funiculars for transport, both materials and people;
- after the position and the nature of track moving vehicles
  - inclined plane located directly on the ground where vehicles run on rails ;
  - suspended funiculars where vehicles are moving on air on cables;
- after the way of acting force ;
  - mechanically operating funiculars, cable cars are driven by a shooter, set in motion by a motor drive system, and could transport task in both downhill and uphill
- after the position and the nature of track moving vehicles
  - inclined plane located directly on the ground where vehicles run on rails;
  - cable cars suspended from the air on wires moving vehicles;
- by the way driving force:
  - mechanically operating funiculars, cable cars are driven by a shooter, set in motion by a motor drive system, and could transport task in both downhill and uphill;
  - gravitational funiculars (without mechanical drive) filled vehicles descend under their own weighty;

- light gravititational cable cars that the travel loads is done by free sliding on cable under the action of its own weight, on short distances;
- funicular railcar that filled carts moving down to the discharge;
- station under the action of its own weight while training at the same time empty carts uphill through the cable drawer, the driving cable with continuous or intermittent motion in one direction;
- Swing funicular, the driving cable changes its way direction after each race, the carts are in motion to "go - come" between stations.

❖ After construction system based on the cable numbers:

- funicular with only one cable - the same cable installed in closed circuit is used to tow the trolley and to support it;
- funicular with two cables, a cable is the raceway and the other one is used to tow the trolley;
- funiculars with three cables are used three types of cables, 2 carrier cables for moving the full carts on separate branches and of the empty ones, and the drawer cable on closed circuit cable
- After the exploitation period:
- final / permanent funiculars which have the operation period that last more than 10 years;
- semi-permanent funiculars, which have the operation period between two and ten years;
- transient funiculars whose lifetime is between one and two years.

❖ After the number of openings:

- funiculars with one opening;
- funiculars with several openings. [2]
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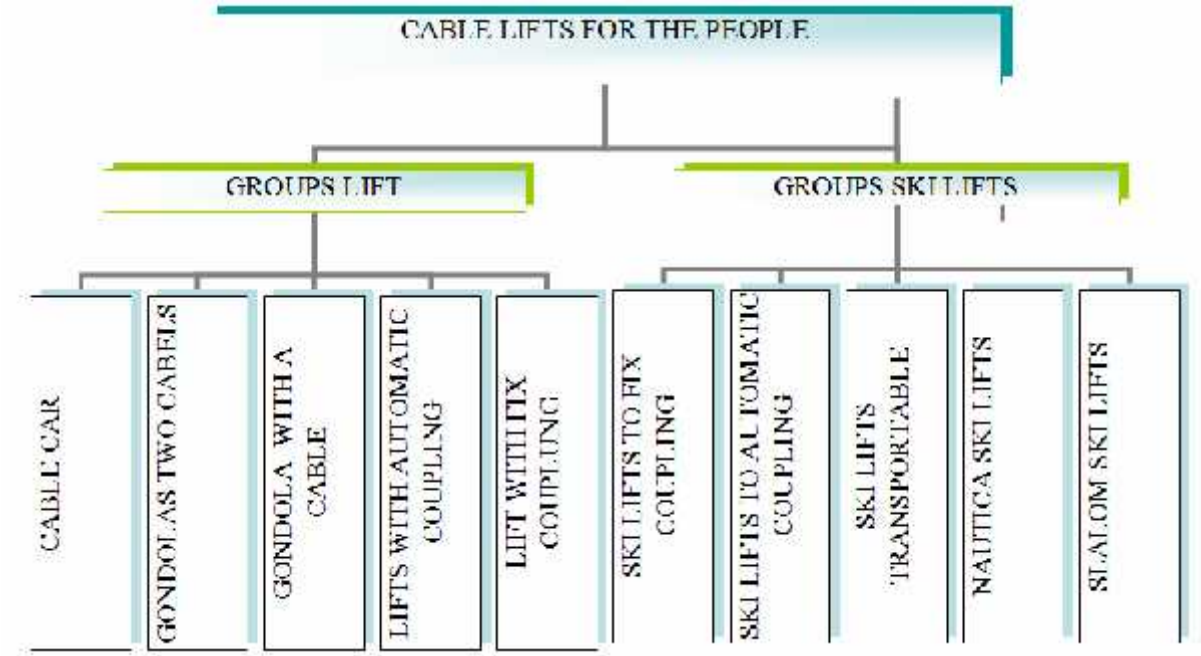

Fig. 3 Classification transport facilities for persons with Cable

4. CONCLUSION

Advantages of cable installations:

- are independent of the ground form, that can be installed in hilly regions;
- link points with large level differences;
- are less influenced by weather conditions in terms of material transportation;
- can be easily moved from one place to another;
- do not cause damage to the transported wood. [1]

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REFERENCES

[1] OLARIU, V. *Maşini de ridicat şi transportat*. Braşov: Institutul Politehnic Braşov, Editura Didactică şi Pedagogică Bucureşti, 1963.

[2] POPA, P. *Cercetări privind creşterea capacităţii de transport la telefericele din România* Braşov, 1983.

[3] IONAŞCU, Gh. *Instalaţii cu cablu.*, Bucureşti: Editura Ceres, 1982.

[4] http://www.oitaf.org

[5] http://upload.wikimedia.org/wikipedia/commons/e/e5/Aerial_tramway_scheme-de.PNG