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(54) **Electric conductor, its manufacturing and mounting**

(57) The invention relates to the electric conductors of air-lines for electricity transmission, which contains a wires from a strong material, for example from steel, on which are wound wires from a material with good electric characteristics, for example from aluminium.

In order to increase the tensile strength of conductor, the length of aluminium wires exceeds the length of the steel wires, and ratio of the length of the aluminium wires and the length of the steel wires equals the value, for which the manufacturing of the lines is optimal, aluminium

wires have deformation of compression,

And steel wires have deformation of stretching, therefore it is possible to increase interval between towers of a line, the costs of the lines can be reduced and the safety and the reliability can be improved by the replacement of conductors of old lines by new ones. Finally the inconveniences for the environment caused by towers of the lines are reduced by the invention.

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Description

[0001] The present invention relates to the electric conductors of air-lines of an electricity transmission. Electric conductors are known, which contain a wires, from a strong material, for example from steel, on which a wires from a material with good electric characteristics, for example, aluminium, are wound.

[0002] Same conductors are, for example, been disclosed in State standards of Russia on wires from steel and aluminium and by website under <http://www.metek-nn.ru/products/37>. (ГОСТ 839-80. Провода сталеалюминиевые.) Steel wires are increasing the conductors tensile strength and are increasing an interval between supports of a line, and it improves characteristics of lines.

[0003] Lack of such conductor that bad use of tensile strength of steel (it is less than 50%).

[0004] This lack because during stretching of the conductor, destruction of the aluminium wires occurs at smaller stretching than the steel wires because of smaller tensile strength of aluminium. It limits tensile strength of all conductor, About it is written into the book of author B.M. Sarychev. The name of the book; "The directory on designing air-lines of an electricity transmission." Publishing house of the Ministry of municipal services RSFSR Moscow-1958 year, page 171, paragraph 10 "Features of calculation of steel-aluminium conductors,

[0005] The object of present invention is to increase the tensile strength of steel-aluminum conductors.

[0006] This object is achieved by exceeding the length of aluminium wires above length of steel wires by optimum size, this is optimum ratio(quotient of division) of length of aluminium wires to length of steel wires. At the accommodation in a conductor jointly steel wires and aluminium wires, aluminium wires have deformation of compression and steel wires have deformation of stretching, size of the force of stretching equals the size of the force of compression. At a stretching of a conductor, at an initial step of a stretching, deformation of compression of aluminium wires decreases and deformation of stretching of steel wires-increases.

[0007] After decrease (reduction) to zero of deformation of aluminium wires, deformation of their stretching begins. Destruction of aluminium wires occurs (happens) to greater force of stretching of a conductor and at the best use of tensile strength of steel wires.

[0008] For manufacturing a conductor, a wires from steel subject an expansible stretching, and it make before winding of an aluminium wires. After winding of an aluminium wire, on the ends of a site with the winding aluminium wires, install wire clips for fastening a positioning of wires.

[0009] For determination of the optimum size of a stretching of the steel wires, for each type of a conductor, it is make several samples of conductor for different sizes of force of the stretching of the steel wire, including size of maximum of the working stretch(permissible load) of the steel wire, and for different sizes of tensile strength of steel(different sort of steel), define tensile strength and price of the produced samples of a conductors and choose the optimum conductor for the electricity transmission fine. The tension of steel wires at manufacturing the optimum sample of a conductor is an optimum tension for manufacturing such conductor. Exceeding the length of aluminium wires above length of steel wires in the optimum sample of a conductor is the optimum of exceeding the length of the wires for such conductor.

[0010] It is offered a new additional way to wind of the produced conductor on the coil and to mounting of a conductor on transmission lines. The produced conductor, after winding its aluminium wires on steel wires, be reeled up on the coil in the tense condition, for reduction of deformation of compression of the aluminium wires. Thus force of stretching wires of steel, exceeds force of compression of aluminium wires on optimal size for reception of good characteristics of a transmission line. It expands opportunities of increase of tensile strength of a conductor. Both ends of a conductor need to be fixed on the coil for preservation of a stretching of a conductor.

[0011] At a mounting of a conductor on transmission lines, a conductor take up from the coil, saving of its tension. In the offered conductor it is possible to apply stronger steel of wires, and it will in addition increase tensile strength of a conductor.

[0012] Advantageous effect of the invention: offer reduces cost of a line, increase its safety and reduces inconveniences for an environment because of supports.

Claims

1. Electric conductor of air-lines of an electricity transmission, which containing a wires from a strong material, for example from steel, on which are wound a wires from a material with good electric characteristics, for example from aluminium,

Characterized in that the length of aluminium wires exceed the length of steel, and ratio (quotient of division) of length of aluminium wires to length of steel wires equals the size, for which the characteristics of conductor (its tensile strength and cost) optimal to making the lines.

2. Mode of manufacturing of the conductor to claim 1,

Characterized in that, for manufacturing a conductor, a wires from steel subject an expansible stretching, the size of increase of length for the expansible stretching equal to the size exceeding of length of aluminium wires to claim 1, and it make before winding of an aluminium wire, after winding of an aluminium wire, on the ends of a site with the winding aluminium wires, install wire clips for fastening a relative positioning of wires, for determination of the optimum size of a stretching of the steel wires, for each type of a conductor, it is make several samples of conductor, for different sizes of force of the stretching of the steel wire, including size of maximum of the working stretch (permissible load) of the steel wire, and for different size of tensile strength of steel (different sort of steel), define tensile strength and price of the produced samples of a conductor and choose the optimum conductor for the electricity transmission line, the tension of steel wires at manufacturing the optimum sample of a conductor is an optimum tension for manufacturing such conductor, the exceeding of the length of aluminium wires above length of steel wires in the optimum sample of a conductor is the optimum of exceeding the length of the wires for such conductor,

3. Mode of keeping and to mounting the conductor to claims 1 and 2,

characterised in that, the produced conductor, after winding its aluminium wires on steel wires, be reeled up on the coil in the tense condition, thus the force of stretching of steel wires exceeds force of compression of aluminium wires, both the ends of the conductor to fasten to the coil, at a mounting of a conductor on transmission lines, a conductor take up from the coil, saving of its tension.



EUROPEAN SEARCH REPORT

Application Number
EP 08 01 4955

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 1 173 190 A (WILLIAM HOOPES) 29 February 1916 (1916-02-29) * page 2, lines 28-52 * -----	1-3	INV. H01B1/02 H01B5/10 H01B9/00 E04C5/08
X	US 3 676 578 A (CAHILL TERENCE) 11 July 1972 (1972-07-11) * column 3, lines 9-36 * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			H01B E04C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 January 2009	Examiner Ribbe, Jonas
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-01-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 1173190	A	NONE	

US 3676578	A	11-07-1972	NONE

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82