

1,397,718.

J. N. BELLWALD.
WIRE ROPE.
APPLICATION FILED MAR. 18, 1920.

Patented Nov. 22, 1921.

FIG. 1.

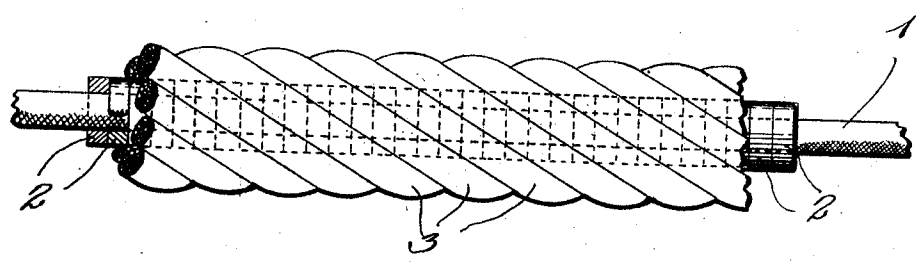


FIG. 3.

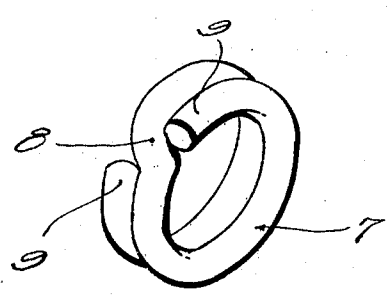
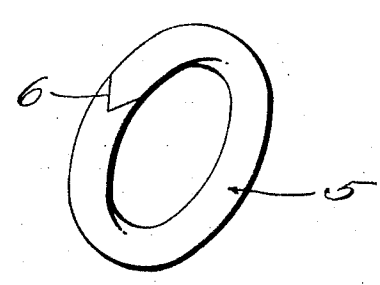


FIG. 2.



Witness

George H. Linworth

Inventor

J. N. Bellwald

By

A. B. Wilson & Co.

Attorneys

UNITED STATES PATENT OFFICE.

JOHN N. BELLWALD, OF MEXICO, MEXICO.

WIRE ROPE.

1,397,718.

Specification of Letters Patent.

Patented Nov. 22, 1921.

Application filed March 18, 1920. Serial No. 366,917.

To all whom it may concern:

Be it known that I, JOHN N. BELLWALD, a subject of the Grand Duchess of Luxemburg, residing at Mexico, in Federal District, Mexico, have invented certain new and useful Improvements in Wire Ropes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in wire ropes, such as used for hoisting cables and various other purposes.

At the present time, wire ropes consist of a plurality of helically wound wires or strands, which are wound around a center or core. A hemp core is used in the majority of instances in making ropes, however, in some instances a metallic core consisting of a wire strand is substituted. Wire ropes in which hemp centers or cores are employed are not entirely efficient in many respects, because when the ropes are put under strain, they stretch and their diameter becomes smaller by reason of the fact that the wires or strands have a tendency to straighten out, and in doing so exert a pressure toward the center or core of the rope. Because of this action, the wires of the various strands which are in contact with one another are subjected to an exorbitant and undue crushing strain, which of course shortens the life of the rope and causes the premature breakage of the wires at these places. These broken wires being in the interior of the rope cannot be detected, thus the ropes break suddenly without giving any previous warning, causing in that way, serious accidents. Even if the rope does not break suddenly, this undue crushing strain between the wires of the various strands shortens considerably the life of the rope. Also, because of the hemp core becoming crushed, and the diameter of the rope becoming reduced, clips, clamps, and friction grips of aerial tramway carriers which are positioned thereon are allowed to slip, very often causing serious accidents. Another and extremely noticeable disadvantage of wire ropes having hemp cores is that the strains to which the ropes are subjected causes the strands to flatten out and assume a substantially elliptical or oval shape, which occurs when they are passed around or over sheaves, as is the case with hoisting

or transmission ropes, and also when sheaves pass over them, as is the case where ropes are employed as tracks for aerial tramways. The ropes in assuming an oval shape as already set forth, cause the wires of the strands at opposite points to bulge out. In this way the wires of the strands are subjected to very short bends in these places, which causes the wires to break prematurely, shortening the life of the ropes considerably.

It seems that even though wire ropes in use at this time present the above and other disadvantages, these conditions are accepted as an unavoidable evil. To overcome these defects, I propose to introduce into the construction of wire ropes, an element, the function of which will be to take up stresses directed toward the center, which occur as soon as the ropes are placed under tension. It is my intention to use a metallic center or core instead of the usual hemp core, preferably, my core consisting of a tubular member composed of relatively movable members which permit free flexing of the rope. The metallic core will be used alone, or it will be employed in conjunction with a suitable filler. This filler may be placed on the outside of the metallic core, that is, between the core and the strands or wires to prevent direct contact of the metals, or it may be placed inside of the tubular core.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same;

Figure 1 is an elevational view of a wire rope embodying a novel metallic core constructed in accordance with this invention.

Fig. 2 is a detail perspective view of a modified form of one of the rings or elements sometimes used in the formation of the core.

Fig. 3 is likewise a detail perspective view of still another form of ring.

Referring to the drawings wherein the preferred embodiment of the invention is clearly illustrated, the numeral 1 designates a rope-like core such as is usually employed in the make-up of wire ropes. Under my idea, I assemble a plurality of separate elements 2, preferably of ring-like formation, on this core so that they abut one another in the manner shown. With this construction and arrangement, it will be seen that the

hemp center or core 1 serves as a novel means for permitting the metallic elements to be easily and readily assembled thereon and it also serves as a novel means for dispensing a lubricant to said metallic elements. Thus, an extremely effective and flexible core is provided. After the core is completed, a plurality of wires or strands of wire 3 are wound in a helical manner about the core to form the complete rope. At this point, I desire to set forth the fact that the hemp center or filler need not be disposed within the metal rings, because in some instances, it may be disposed on the outside of these rings to prevent direct contact of the wires of the strands with the rings of the core, which circumstances would otherwise lessen the life of the rope. Whether it is inside or outside of the metal rings, this filler serves as an effective means for dispensing a lubricant and emphasis is to be laid on this construction.

In Fig. 1 I have shown the core as being made up of a plurality of metal rings of flat cross section, but I desire it to be understood that these rings may be constructed, if desired, as shown in Figs. 2 and 3 wherein, in the first mentioned figure a round ring 5, split at 6 is shown, while in the last figure a round wire ring 7 of different construction is shown. This ring 7 will be provided with a laterally offset portion 8 and the free ends 9 bear against this portion 8 which forms a shoulder therefor. In use, these rings will be pressed around the hemp filler 1.

A wire rope constructed in accordance with my invention will be found extremely useful and advantageous in every respect, that because of the employment of the tubular metal core shown, which insures the ropes will be less liable to lose their original shape in passing over sheaves or the like, avoiding, to a great extent, sharp bends of the wires of the strands on opposite sides of the rope which permits the wires to break in little or no time. Also, the rope will not stretch, and will thus do away with the periodical cutting off and resplicing the ropes as is now customary. Rope clamps, clips, and the like, which are employed in many instances with ropes of this type, will be prevented from slipping and losing their grips on rope, due to the prevention of a decrease in diameter of the rope which now ordinarily occurs. Another feature resides in the fact that this metallic core will not be crushed as the ordinary unprotected hemp core or center is consequently, the lubricant which is contained in the protected hemp center of my core will not be squeezed out. Because of this, the necessary interior lubrication of the ropes will be provided for during their entire life, thus insuring prolonged preservation of the rope.

By employing a tubular core such as I use, instead of the core formed by a wire strand which is one of the constructions now used, the ropes will be more pliable and the weight of the ropes will be greatly reduced without impairing the strength of the ropes. With the metal cores now in use, lubrication of the ropes is practically impossible. On the contrary, the metallic core which I use will permit effective lubricating of the rope. For this reason and the others above enumerated, the life and effectiveness of wire ropes will be greatly prolonged. Prolongation of the life of wire ropes will also contribute to the safety of their use which is very important, because thousands of lives are intrusted to the safety of wire ropes every day.

While I have shown and described my core as being used in conjunction with round wire ropes, I desire it to be understood that it may be equally well used with ropes of different designs, for instance, the locked coil types and spiral wire ropes.

Another important feature of my invention resides in the fact that the tubular core may be made in many ways. For example, it may be formed of sections of spiral coils placed side by side, or of rings or disks of various forms, shapes and designs placed alongside one another. The coils and rings may be made from various appropriate kinds of metals or metallic alloys, and the rings may be formed from one piece of metal or may be built up in two or more sections, or may be formed by a spiral coil of one or more windings, as mentioned above. The exterior circumference of these rings and coils may be round and smooth, or may be fashioned in various ways, so as to provide more bearing surface for the strands.

A careful consideration of the foregoing description taken in connection with the drawings, will enable those skilled in the art to which this invention pertains, to acquire a thorough understanding of the objects and advantages thereof without a more lengthy description.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred form of the same and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim as my invention:—

1. A wire rope including a tubular flexible metal core made up of a plurality of separate elements and a plurality of wires or strands of wire which are wound around the core.
2. A wire rope including a tubular metal core composed of a plurality of relatively movable separate ring-like members, and a plurality of wires or strands of wire helically wound around the core.
3. A structure set forth in claim 1, a filler of absorbent material being used in conjunction

tion with the core and serving to contain and dispense a lubricant.

4. A wire rope comprising a flexible core composed of a plurality of axially alined separate independently movable elements arranged in abutting relationship, and a plurality of strands of wire wound in a helical manner around the core.

ter of absorbent material, a plurality of 10 metal ring-like elements assembled on said center and arranged in abutting relation, and a plurality of wire strands wrapped around said elements.

In testimony whereof I have hereunto set 15 my hand.

JOHN N. BELLWALD.

5. A wire rope comprising a rope-like cen-