Jan. 15, 1929. 1,699,174

H. L. WHITTEMORE

WIRE ROPE

Filed Nov. 5, 1927

Fig. 1.

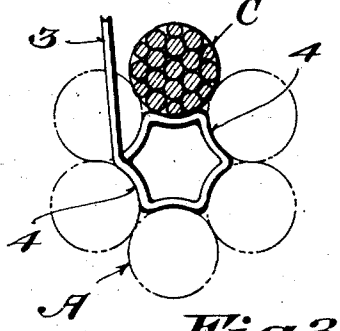


Fig. 2.

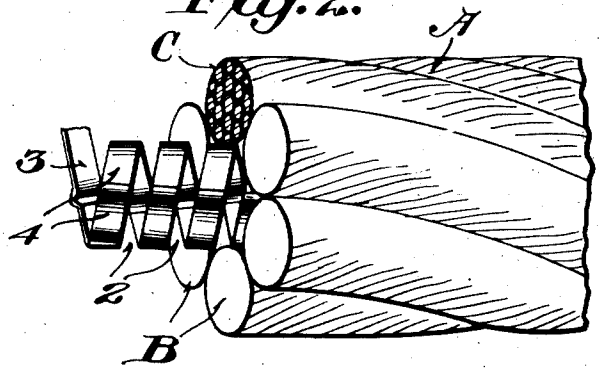
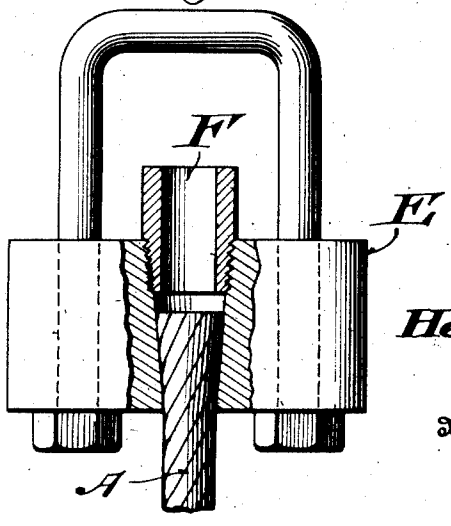


Fig. 3.



Inventor

Herbert L. Whittemore,

By Andrew T. Dupont

his Attorney

Patented Jan. 15, 1929. 1,699,174

UNITED STATES PATENT OFFICE.

HERBERT L. WHITTEMORE, OF WASHINGTON, DISTRICT OF COLUMBIA.

WIRE ROPE.

Application filed November 5, 1927. Serial No. 231,309.

My invention relates to the construction of wire ropes and cables such as are commonly used for hoisting on elevators, dredges, conveyors and similar machinery.

In the manufacture of wire ropes it is customary to lay the strands of wire over a core to hold the strands in their proper relative position and when the rope is under load, to resist the compressive forces which are exerted by the strands as they straighten out and therefore approach the axis of the rope.

Jute, flax, cotton, sisal, and manila fibers are generally used for the core of wire ropes but under severe conditions failure of the core causes the strands to become displaced and the rope rapidly deteriorates and fails. The failure of the core is due to the constant rubbing of the fibers thereof over each other under heavy pressure so that they no longer hold the strands in the correct position.

In the oil fields, in drilling wells, the conditions are very severe and when failure of the core is observed, it is customary to "roll in" a new core to prolong the life of the rope.

One object of my invention is the use of a core for wire ropes which will possess flexibility combined with high resistance to wear and considerable compressive strength combined with the property of being deformed considerably without fracture.

Another object of my invention consists in the use of a core which will hold lubricant adapted to be gradually forced out into contact with the strands to lubricate the wires.

With these and other objects in view, my invention consists in the features of construction and operation set forth in the following specification.

Referring to the drawings:

Fig. 1 is an end view of a rope constructed in accordance with my invention.

Fig. 2 is a view in elevation of a rope-section with a portion of the core uncovered.

Fig. 3 illustrates means for conveying lubricant to a rope built in accordance with my invention.

Similar characters of reference corresponds to similar parts in the different views.

A indicates a wire rope, which, as shown, is composed of several strands B of which there may be any desirable number. The strands may also contain any suitable number of wires C.

I use a core formed of a metal strip 3 bent into a helical spring of the desired diameter such as shown in Figs. 1 and 2. The cross-section of this metal strip may be of any form, round or rectangular. A rectangular strip is the preferred shape for the reason that it offers better resistance to the wear as it presents a greater surface to the wires forming the strand. The strip 3 may be of any suitable material but spring steel is preferably used. The spring temper is obtained by wrapping the annealed strip around a mandrel of suitable size, then heat-treating it to produce the desired physical properties before the rope is fabricated by laying the strands around the core.

The helix should preferably not be wound too close, that is, with the coils in contact. The coils should be separated by suitable spaces 2, so that they may come together on the inside of the bend when the rope is used around a sheave or a drum, or the like.

The strands should preferably cross the coils of the core at as great an angle as practicable, therefore, the lay of the strands should be right hand and the helix of the core left hand or vice versa.

I provide the helical core strip with concave depressions or grooves 4 formed helically along the outer periphery of the strip and corresponding in number to the number of strands, so that each strand lays in a depression or groove on the core strip. It is apparent that the area in contact between the strands and the core in this modification is much increased and the advantages of such construction will be readily understood.

In Fig. 3 I have shown means for supplying lubricant to a wire rope embodying a core of my construction. Heretofore, in renewing the lubricant on a wire rope, it has been necessary to apply it to the outside of the rope and in this manner a quantity of the lubricant finds its way through the wires of the strands and is absorbed by the core. The ineffectiveness of this method of lubrication shortens the life of a wire rope considerably. I overcome this difficulty by feeding the lubricating medium under pressure directly to the hollow core whence it passes to the strands and out to the outer periphery thereof.

At E is conventionally shown a clevis or bridge socket or other suitable attaching means to which the dead end of the rope is fastened, it being understood that the load is secured to one end of the clevis, or bridge socket. At F is shown a pipe permanently mounted in the clevis or socket. This pipe is

in communication with an oil pump or other suitable pressure producing means so that a lubricating medium may be supplied through the pipe F to the hollow core. The lubricant will thus find its way to the spaces between the helical coils of the core and thence throughout the length of the rope, to all the strands as it is needed.

The advantages of a helical core will be readily apparent. It has a much greater compressive strength than the fiber core used heretofore and will deform sufficiently to permit the rope to pass over sheaves, drums or the like, without excessive stresses in the strand wires. It resists wear and permanent deformation much better than a fiber core and outlasts the rope so that failure of the rope due to failure of the core is prevented.

It is obvious that any number of strips may be used if desired.

It is to be understood that my improved core may be readily used in wire ropes having any strand fabrication or construction and that I intend the scope of my invention as disclosed herein and defined in the appended claims to include modifications and other adaptations which this disclosure will readily suggest to persons skilled in the art.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a wire rope, a plurality of wire strands, a hollow core comprising a flat metallic strip wound as a helix, and a plurality of helical grooves on the outer periphery of the helical core providing bearing surfaces for the strands.

2. In a wire rope, a plurality of wire strands, a hollow core adapted to contain lubricant and comprising a metallic strip wound as a helix, and a plurality of helical grooves on the outer periphery of the helical core providing bearing surfaces for the strands.

In testimony whereof I hereunto affix my signature this 4 day of November, 1927.

HERBERT L. WHITTEMORE.