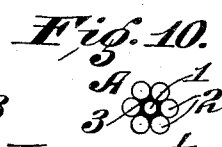
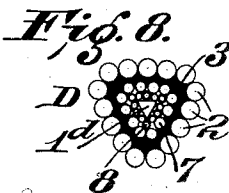
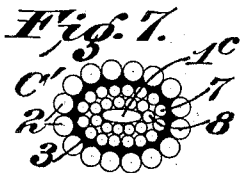
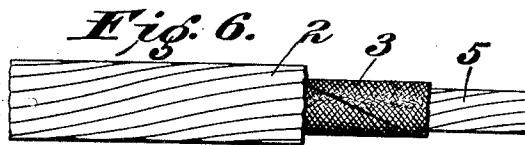
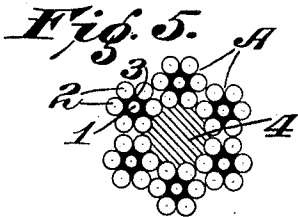
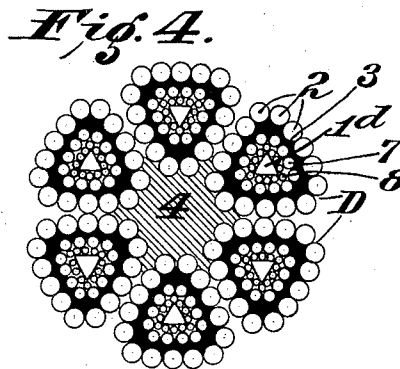
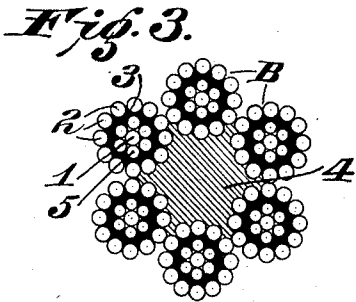
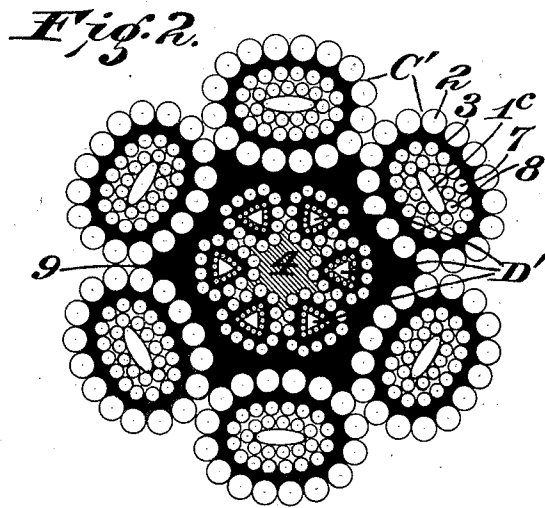
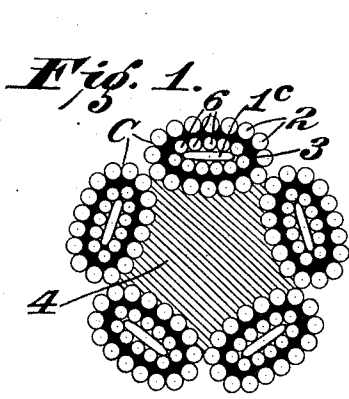


975,541.

Patented Nov. 15, 1910.



Witnesses:

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Inventor:

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# UNITED STATES PATENT OFFICE.

HENRY LESCHEN, OF ST. LOUIS, MISSOURI.

## WIRE ROPE.

975,541.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed April 26, 1909. Serial No. 492,138.

*To all whom it may concern:*

Be it known that I, HENRY LESCHEN, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Wire Rope, of which the following is a specification.

My invention relates to wire rope and has for its principal objects to minimize the friction of the wires against each other; to guard against the corrosion or rusting of the interior members of the rope; to minimize the tendency of the metal to "crystallize"; to minimize abrasion; and to accomplish said objects without interfering with the easy inspection of those wires which stand the brunt of the wear.

The invention consists principally in providing a wire rope with cushions of fibrous material underneath the outermost wires or strands; it also consists in impregnating said cushion or cushions with a suitable lubricant.

It also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification and wherein like symbols refer to like parts wherever they occur, Figure 1 is a sectional view of a cable embodying my invention, said cable comprising elliptical strands arranged about a hempen core; Fig. 2 is a cross section of a wire rope whose middle portion is similar to the construction illustrated in Fig. 4 and is surrounded by a layer of elliptical strands; Fig. 3 is a cross section of a rope whose individual strands are formed on a round core; Fig. 4 is a cross sectional view of a wire rope whose individual strands are formed on a core of triangular section; Fig. 5 is a cross section of a wire rope whose individual strands consist of a layer of wire surrounding a central wire; Fig. 6 is a side view of a rope or strand embodying my invention, the outer layer of wires being removed from the right end portion of said view; Figs. 7, 8, 9 and 10 are sectional views of individual composite strands.

In its simplest form, my rope comprises a core 1 and a single layer of wires or strands 2 surrounding the same with a layer 3 of fibrous material intervening between the core and the layer of wires or strands. For instance, as illustrated in Fig. 10, the core is a single round wire, around which is

wrapped a layer of fibrous material impregnated with plumbago, graphite, mica, asphalt, oil or other suitable lubricant; and surrounding this layer of fibrous material is an outer layer of individual wires. This construction constitutes a complete rope and is capable of use as such. It has the obvious advantage of furnishing a lubricant between the core and the outer layer of wires and thus minimizes friction between the core and the wires of the surrounding layer. Likewise, the practical use of the rope tends to force the lubricant or fibrous material between the individual wires of the outer layer and thereby minimize the friction between such wires. Again, the layer of fibrous material constitutes a cushion which affords a means of distributing and dissipating to a greater or less extent the stresses which tend normally to "crystallize" the wires of the outer layer when they flex or bend around sheaves, winding drums and the like; and at the same time, this cushion has a tendency to minimize the abrasion or wear of those wires which come in contact with the sheave or winding drum. In actual practice, the wires of the outer layer are submitted to the most severe stresses and wear, and are usually the first to give way. For this reason, it is important that these outer wires should always be subject to inspection; and it is noted as an important advantage of my present invention that the outer wires are always subject to inspection.

The foregoing description is based upon the simplest type of rope, as illustrated in Fig. 10; the statements applicable thereto are equally applicable to ropes of different shapes and more highly organized. For instance, instead of the strands or members of the outer layer of the rope being single wires, each one of said members may itself be a composite strand. When composite strands are used, it is generally preferable to arrange them around a central core of hemp or other suitable fibrous material impregnated with a suitable lubricant, as illustrated in Figs. 1, 2, 3, 4 and 5. In the rope illustrated in Fig. 5, each composite strand A is of the same construction as that hereinbefore described and particularly illustrated in Fig. 10. In the construction illustrated in Fig. 3, each composite strand B has the construction illustrated in Fig. 9: Said strand has a round wire core 1 surrounding which is a layer of round wires 5, which in turn is

surrounded by a layer of fibrous material 3, and around this fibrous layer is the outermost layer 2 of round wires. In the rope illustrated in Fig. 1, each composite strand C has as its core an elliptical or flattened wire 1<sup>c</sup>; and surrounding this wire is a layer of round wires 6 around which is a layer of fibrous material 3, and around this layer of fibrous material is the outermost layer of round wires 2. In the rope illustrated in Fig. 4, the core of each strand D is a triangular wire 1<sup>d</sup> and this core is surrounded by two layers of round wires 7, 8 around which is wrapped a layer of textile fabric or fibrous material 3 around which is the outermost layer of round wires 2: Fig. 8 illustrates one of the composite strands of the rope illustrated in Fig. 4. The rope illustrated in Fig. 2 has a core 4 of hemp or other suitable fibrous material surrounded by composite strands D' formed on triangular cores. Surrounding this layer of triangular strands is a cushioning wrapper or covering 9 of fibrous material suitably lubricated, and surrounding this cushioning wrapper is an outer layer of composite strands C' of elliptical form. The composite triangular strands D' of the inner layer are similar to that illustrated in Fig. 8, except that only a single layer of wires intervenes between the fibrous wrapper and the triangular core. The elliptical composite strands C' of the outer layer of the rope illustrated in Fig. 2 are similar to the composite strands C of Fig. 1, except that two layers of round wires intervene between the fibrous layer and the elliptical core. Fig. 7 illustrates one of the composite strands C' of the outer layer of the rope illustrated in Fig. 2.

It is noted that in all of the constructions hereinbefore described, the outermost wires are exposed to view and thus are subject to inspection at all times. This is a most important advantage, as in practice the outermost wires are usually first to fail. It is also noted that the layer of fibrous material underneath the outermost wires serves to cushion them against shock when they contact with the drum or sheave and thereby tends to minimize abrasions; and likewise said cushioning layer serves to minimize the crystallizing tendency produced by flexing or bending of the wires around the sheave. The cushioning layer also serves to protect the inner layers from the atmosphere and thereby prevent rusting, and it furnishes a supply of lubricant to prevent the friction of the wires upon each other.

Obviously, the rope hereinbefore described admits of considerable modification without departing from my invention, and I do not wish to be restricted to the particular constructions hereinbefore described. For instance, the cushioning layer may be braided

or knitted directly on the core or inner portion of the rope; or it may be wrapped around the same in the form of yarn or fabric. So, too, in some instances, it may be desirable to make the cushioning layer of sheet rubber or otherwise use rubber as an ingredient in the cushioning layer.

What I claim is:

1. A wire rope having its outermost strands exposed to view and an annular layer of fibrous and lubricant material underlying said outermost strands.
2. A wire rope having its outermost wires uncovered and an annular layer of fibrous and lubricant material underlying the same.
3. A wire rope comprising a plurality of uncovered strands each consisting of a plurality of wires, and an annular layer of fibrous material underlying the outermost wires of each strand.
4. A wire rope comprising a plurality of uncovered strands each consisting of a plurality of wires, and an annular layer of fibrous and lubricant material underlying the outermost wires of each strand.
5. A wire rope comprising a core of fibrous material and a plurality of layers of strands surrounding said core, the strands of the outer layer being uncovered, and an annular layer of fibrous material underlying the outermost layer of strands.
6. A wire rope comprising a plurality of layers of strands, the strands of the outer layer being uncovered, and an annular layer of fibrous material impregnated with lubricant material underlying the outermost layer of strands.
7. A wire rope comprising a core of fibrous material and a plurality of strands of wires surrounding the same, each strand comprising a plurality of layers of wire with a layer of textile fabric wrapped around the inner layer to form a cushion for the outermost layer.
8. A wire rope comprising a core of fibrous material and a plurality of strands of wires surrounding the same, each strand comprising a plurality of layers of wire with a layer of textile fabric wrapped around the inner layer to form a cushion for the outermost layer, said textile fabric having a lubricant material therein.
9. A wire rope comprising a core of fibrous material, an inner layer of strands of wire surrounding said core, a wrapper of textile fabric surrounding said inner layer, and an outer layer of strands surrounding said wrapper, each of the strands of said inner layer comprising a plurality of layers of wire with a textile fabric wrapper around the inner layer to form a cushion for the outermost layer.
10. A wire rope comprising a core of fibrous material, an inner layer of strands of wire surrounding the same, an outer layer

of strands of wire, and a wrapper of textile fabric immediately underlying said outer layer, each strand of said inner layer comprising a plurality of layers of wire with a textile fabric wrapped around the inner layer to form a cushion for the outermost layer of said strand, the textile fabric containing lubricant material.

11. A wire rope comprising a core, and an outer layer of strands, and a mass of fibrous material underlying said strands, each strand comprising an elliptical wire core, an outer layer of wires surrounding said core and exposed to view, and a layer of fibrous material underlying said outer wires.

12. A wire rope comprising a fibrous core,

a layer of strands surrounding said core, a layer of fibrous material surrounding said layer of strands, and an outer layer of strands exposed to view surrounding said layer of fibrous material, each strand of said outer layer comprising an elliptical core, an outer layer of wires exposed to view, and a layer of fibrous material underlying said outer wires.

Signed at St. Louis, Missouri, this 24th day of April, 1909.

HENRY LESCHEN.

Witnesses:

JAMES A. CARR,  
J. B. MEGOWN.