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WIRE ROPE.

1,348,033.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE C. MOON, a citizen of the United States, and resident of Cranford, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Wire Rope, of which the following is a specification.

The object of my invention is to provide a wire rope or cable which shall possess the qualities of great strength with desired flexibility and greater sectional area of metal as compared to standard wire ropes of corresponding diameter, my improved rope or cable also having the outer strands laid in such a manner as to provide a smooth exterior surface to reduce wear on the individual wires of the outer strands and to operate smoothly on drums and pulleys.

My invention comprises a wire rope or cable having a core, a series of strands laid around the core, each strand comprising a plurality of individual wires twisted together, and outer strands laid around said series of strands, said outer strands each comprising a plurality of individual wires twisted together, the outer strands alternating in diameter, all of the strands being laid in the same direction, the larger outer strands lying in the interstices between the inner strands and the smaller outer strands lying upon the inner strands, whereby the outer surfaces of all the outer strands are substantially evenly disposed on the surface of the rope or cable.

Other features of my invention will be more fully hereinafter set forth and then pointed out in the claims.

Reference is had to the accompanying drawings forming part hereof wherein—

Figure 1 is a side view of a piece of wire rope embodying my invention;

Fig. 2 is an enlarged cross section on the line 2, 2 of Fig. 1;

Fig. 3 is an enlarged detail of one of the twisted wire strands;

Fig. 4 is a section on the line 4, 4 in Fig. 3.

Fig. 5 is a detail side view of a piece of rope showing wires arranged differently from Fig. 1.

A core 1 may be of hemp or any other suitable or usual material adapted for use in a wire rope or cable. An inner series of strands 2 is laid around said core side by side in the same direction. Said strands

each comprise a plurality of individual wires 2^a twisted together. The wires 2^a of each strand are shown twisted together in the direction opposite to the laying of said strands around core 1, that is to say, the wires 2^a of each strand 2 are shown twisted to the left hand while the strands 2 are laid on core 1 to the right hand to resist the tendency of the inner series or layer of strands 2 to unwind. Such relative directions of said wires and strands may be reversed. Each strand 2 is shown comprising seven individual wires 2^a, there being six wires symmetrically disposed around an inner or central wire. In the example illustrated there are six strands 2 of seven individual wires 2^a each, wound side by side around core 1, although the number of said strands as well as the number of individual wires in each strand may be varied as desired.

At 3, 4 are indicated an outer series of strands alternating side by side laid around the inner strands 2 in the same direction as the latter. The strands 3 each comprise a plurality of individual wires 3^a and the strands 4 each comprise a plurality of individual wires 4^a. The wires 3^a, 4^a of the respective outer strands 3, 4 are shown twisted together in the direction opposite to the laying of said strands around the strands 2, that is to say, the wires 3^a, 4^a of each respective strand 3, 4 are shown twisted to the left hand while said strands 3, 4 are laid around the strands 2 to the right hand, (Fig. 1), to resist tendency of the outer series or layer of strands 3, 4 to unwind. Such directions of the wires 3^a, 4^a and corresponding strands 3, 4 may be reversed.

The outer strands 3 are located in the interstices between the adjacent inner strands 2 and the outer strands 4 are located between strands 3 and rest upon the outer surfaces of the corresponding inner strands 2. The wires 3^a of strands 3 are shown of greater diameter or gage than the wires 4^a of strands 4, the strands 3 and 4 thus being of different diameters and alternating in position around the inner layer of strands 2. The number and gage of individual wires in the strands 3, 4 may be varied as desired to provide the strands 3 of greater diameter than the strands 4. By the arrangement described the outer smaller strands 4 fit properly in the

spaces between and alternate with the larger outer strands 3 so that the outer surfaces of the outer strands 3, 4 are substantially evenly disposed around the completed rope or cable, 5 providing a relatively smooth exterior of the latter. The dotted line in Fig. 2 indicates approximately the outer surface of the rope or cable.

In Fig. 5 the individual wires of the 10 strands are twisted in the same direction as the lay of the strands around the core.

In the example illustrated the strands 3 and 4 each comprise 7 individual wires, and as there are six strands 2, 3, 4 of seven in- 15 dividual wires each, I am enabled to provide a rope or cable of a given diameter having 126 individual wires as against 119 wires in a standard rope or cable of the same diameter. Corresponding increase or decrease 20 of the number of wires may be made according to the diameter of the rope or cable desired.

In accordance with my improvements set forth I provide a wire rope or cable of great 25 strength, having a greater sectional area of metal than a corresponding rope or cable of standard well known construction, the interstices and otherwise waste spaces between various strands being filled with metal wires, 30 providing a compact closely fitting series of wires. My improved rope or cable possesses great flexibility by reason of the larger number of individual relatively small wires utilized, twisted and wound together in such 35 a manner as to bear upon one another evenly and smoothly without strands crossing one another, thereby obviating disadvantages inherent in ropes and cables having crossed strands tending to abrade one another.

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

1. A wire rope or cable comprising an inner series of strands each having a plu- 45 rality of wires twisted together and an outer series of strands each having a plurality of wires twisted together, some of the outer strands being of greater diameter than others and alternating therewith around the 50 rope or cable.

2. A wire rope or cable comprising an inner series of strands each having a plurality of wires twisted together and all laid side by side in the same direction, and an outer series of strands laid in the same di- 55 rection as the inner strands, said outer strands each having a plurality of wires twisted together, some of the outer strands being of greater diameter than others.

3. A wire rope or cable comprising an 60 inner series of strands each having a plurality of wires twisted together and all laid side by side in the same direction, and an outer series of strands laid in the same direc- 65 tion as the inner strands, said outer strands each having a plurality of wires twisted together, the wires of some of the outer strands being larger than the wires of other outer strands, the latter strands being of less diameter than the outer strands having the 70 larger wires.

4. A wire rope or cable comprising an inner series of strands each having a plu- rality of wires twisted together, said strands 75 being laid in a direction reverse to the direction of twist of said strands, and an outer series of strands each having a plurality of wires twisted together, said strands being laid around the inner strands in the same direction as the latter, some of the outer 80 strands being of greater diameter than others.

5. A wire rope or cable comprising an inner series of strands each having a plu- rality of wires twisted together, said strands 85 being laid in a direction reverse to the direction of twist of said strands, and an outer series of strands each having a plurality of wires twisted together in the same direction as the twist of the wires of the inner strands, 90 said outer strands being laid around the inner strands in a direction reverse to the direction of twist of the outer strands, some of the outer strands being of greater diam- 95 eter than others.

Signed at New York in the county of New York and State of New York this 8th day of March A. D. 1920.

GEORGE C. MOON.