

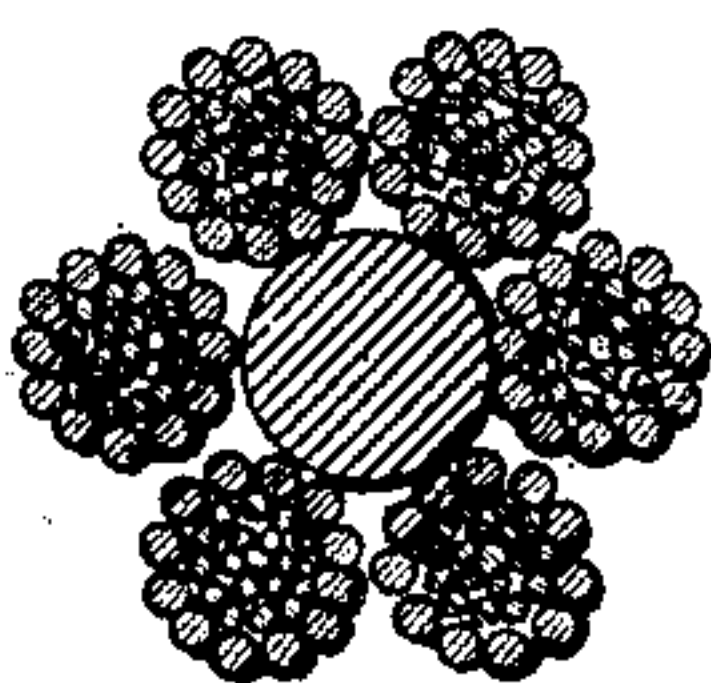
(No Model.)

T. SEALE.  
WIRE ROPE OR CABLE.

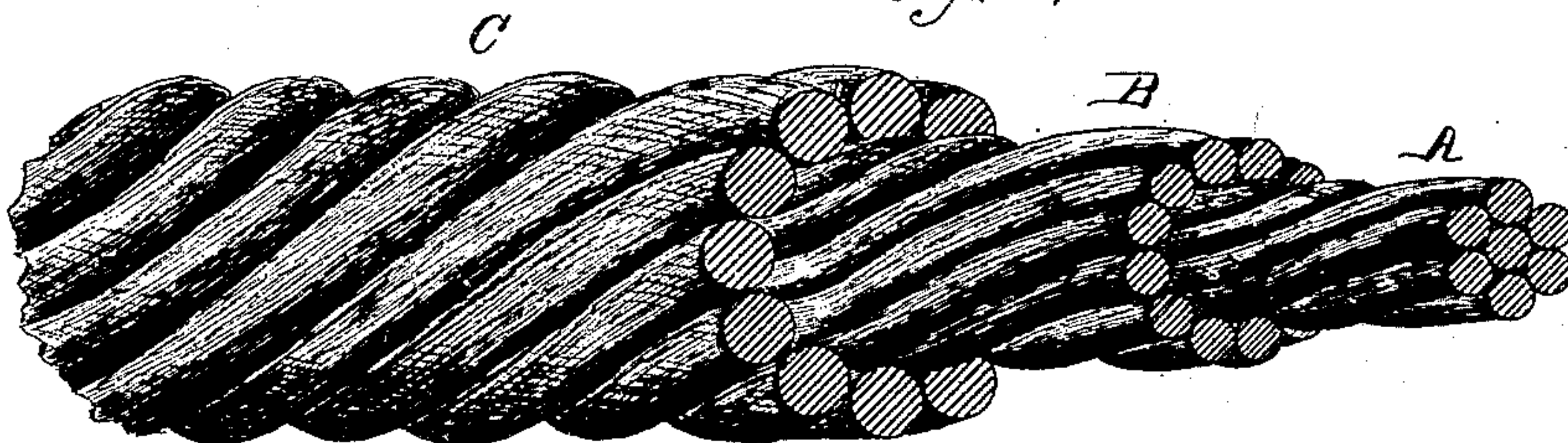
No. 315,077.

Patented Apr. 7, 1885.

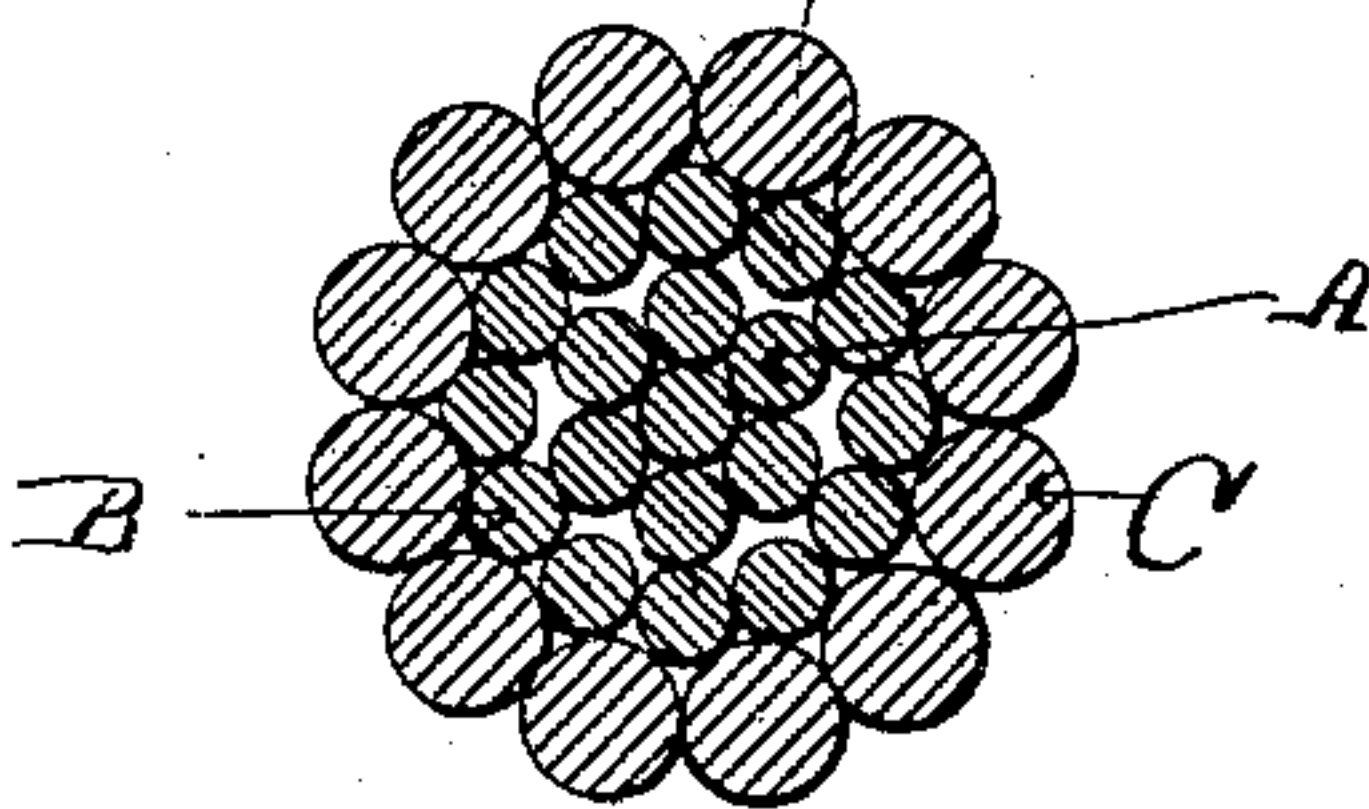
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

THOMAS SEALE, OF SAN FRANCISCO, CALIFORNIA.

## WIRE ROPE OR CABLE.

SPECIFICATION forming part of Letters Patent No. 315,077, dated April 7, 1885.

Application filed March 16, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS SEALE, a citizen of the United States, residing in the city and county of San Francisco, State of California, have made and invented certain new and useful Improvements in Wire Ropes or Cables for Propelling Cars on Endless-Cable Traction-Railways; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had by figures and letters to the accompanying drawings.

My invention relates to wire ropes or cables for propelling purposes, in which certain qualities and properties are obtained that render it peculiarly adapted for propelling cars under what is known as the "endless-cable traction system." A cable for this purpose is subject to many strains and forces in addition to the general tensile strain, as it is carried over and under and around many drums, guide-sheaves, and pulleys in its course of endless travel from end to end of the road, and in its change of direction to and from the horizontal, as such roads are carried up and down inclines as well as at a level, while the great force and pressure applied by the gripping devices that connect cars and cable is also included as one of the destructive elements or forces acting in conjunction with the bending and flexures before mentioned. A cable for propelling purposes, therefore, should have qualities of strength and longevity in its structure to render it serviceable, as the welfare and profits of such a road are seriously affected whenever a cable is worn out and requires to be renewed, for besides the great cost of the cable itself the work of removing the one and placing the other is attended with much expense in labor and the suspension of travel for the time. These qualities necessary in the structure of this class of cable depend upon and are governed by the amount of flexibility with a given strength that can be obtained; and by means of my improvement a requisite degree of flexibility is obtainable without diminishing the tensile strength, but rather increasing it.

To such end and purpose my invention consists in a wire rope formed of strands laid round a center, each strand being composed of a core, a set of wires wound compactly round said core side by side, and a second set

of wires of a larger size wound round the first set with the same lay as the latter, and fitting into each of the interstices or spaces formed by the first set, and meeting, as hereinafter described, to form a solid unbroken surface.

It also consists in a wire cable having strands composed of a heart of finer wires, and a covering of coarser wires having the same lay with the surface wires of the heart, and corresponding in number of wires with the spaces or interstices in this surface, as will hereinafter be described, and pointed out in the claims.

To enable my improvement to be practiced and practically carried out, I will proceed to describe the mode in which I proceed to make a propelling-cable of ordinary size, about one and one-quarter inch in diameter, reference being made by figures and letters to the accompanying drawings, in which—

Figure 1 is a section of the completed cable; Fig. 2, a perspective view of one of the strands, showing each layer of wires cut off at different lengths; and Fig. 3 is a section of a completed strand. Figs. 2 and 3 are made on an enlarged scale.

To form the core A, seven wires of No. 17 (B. W. G.) "Birmingham Wire Gage" are twisted together by suitable machinery, and over this core a layer, B, produced from twelve wires of the same gage, is laid closely and firmly either with the same or a contrary lay. This body of fine wires gives a smooth round surface for the wires of the outer covering, C, to lie against. This third layer C, forming the outside of the strand, is composed of twelve wires, equal in number with those of the outside of the heart, but of lower gage—say about 13 B. W. G.—and laid with the same twist, so that as nearly as possible the coarse wires of the outside shall lie in the spaces or interstices between the fine wires of the heart surface. This gives great flexibility to the strand and in the cable, with solidity and compactness, while the wires of the outside or covering of the heart lie upon a comparatively smooth and not upon a surface of ridges, as in other constructions, where there exists considerable difference between the lay of one surface and that of the other, or where the outside wires cross the heart wires.

In producing the heart from a body of fine wires in this manner the different layers of



the heart could have a contrary lay; but this would reduce the pliability of the finished strand without adding to the strength.

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

1. A wire rope formed of strands laid round a center, each strand being composed of a core, a set of wires wound compactly round said core side by side, and a second set of wires of a larger size wound round the first set with the same lay as the latter, and fitting into each of the interstices or spaces formed by the first set, and meeting, substantially as described, to

form a solid unbroken surface, as and for the purpose set forth. 15

2. A wire cable formed of strands composed of a heart of finer wires, and a covering of coarser wires having the same lay with the surface wires of the heart, and corresponding in number of wires with the spaces or interstices in this surface, as and for the purpose set forth. 20

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