(No Model.)

# C. M. THOMPSON.

## ROPE OR CABLE.

No. 400,970. Patented Apr. 9, 1889.

Fig 1.

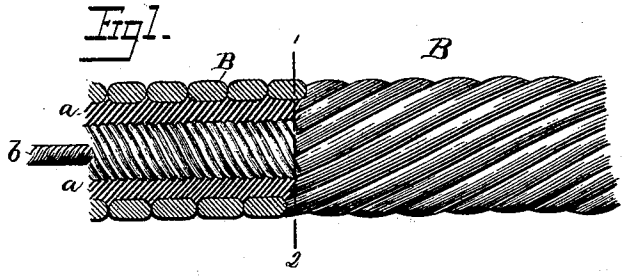



Fig 2.

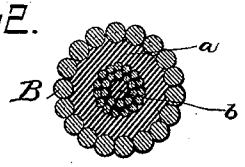
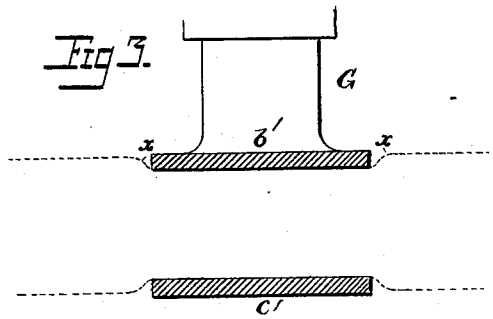



Fig 3.




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# UNITED STATES PATENT OFFICE.

COLIN M. THOMPSON, OF BROOKLYN, NEW YORK.

## ROPE OR CABLE.

SPECIFICATION forming part of Letters Patent No. 400,970, dated April 9, 1889.

Application filed February 10, 1885. Serial No. 155,505. (No model.)

*To all whom it may concern:*

Be it known that I, COLIN M. THOMPSON, a citizen of the United States, and a resident of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Ropes or Cables, of which the following is a specification.

My invention relates to that class of ropes or cables which are designed for use as wrapping conductors to connect pulleys on separate shafts for transmitting power, and especially for use in connection with cable railways; and it has for its object to so construct the cable as to enable the gripping devices to grasp the same more firmly, and also to secure a better wearing-surface, more durable and less liable to become broken or frayed than that of cables made in the ordinary manner, and yet maintain the requisite flexibility of the rope without any undue increase in its sectional area. I secure these objects by making a compound cable having a non-extensible flexible core, a wrapper of rubber surrounding the core, and an outer portion of heavy wires or strands, substantially as illustrated in the accompanying drawings, and as fully hereinafter described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a longitudinal view in part section, illustrating my improved cable. Fig. 2 is a transverse sectional view on the line 1 2, Fig. 1; and Fig. 3 is a view representing a section of a cable constructed according to my invention and held within the jaws of a gripping device, shown in section, such as is used on street-cars, &c.

Wire cables intended for the transmission of power, cable railways, or as wrapping conductors for use to connect pulleys in mills or for raising elevators, &c., have heretofore been generally made by twisting together strands of nearly the same size, the outer portions of such cables in the majority of cases consisting of comparatively small wires, which are rapidly worn away by the frictional contact of the gripping devices, pulleys, &c., so that the rope in a short time becomes frayed and is apt to get entangled with the gripping devices or slip from the pulleys.

While the use of heavier wires upon the exterior face of the rope will render it more durable and obviate the objections above referred to, the application of the same directly to an incompressible center or body of the cable results in making the whole so stiff and rigid that it will not readily bend around pulleys of ordinary diameter without being greatly strained and soon broken.

I have succeeded in constructing a cable not open to any of the objections specified, and which permits a much firmer grip than can be secured upon cables of the ordinary construction, as well as to be bent about a smaller pulley.

I provide the cable with a central non-extensible portion or core, *b*, which may, if desired, consist of an ordinary wire cable composed of comparatively small wires laid parallel with each other or twisted into a rope in the ordinary manner. In practice, however, I prefer to make said core *b* of a flexible slightly-elastic material, as rope or hemp, with surrounding layers of wire, as shown in Figs. 1 and 2. I surround the core *b* with rubber *a* to the desired depth, which I again surround or inclose in an external wrapper, B, of large wire, winding the same spirally around the rubber *a*, as shown in Fig. 1.

While the wires composing the external portion, B, of the cable may be of sufficient thickness to insure the requisite durability of said cable and prevent the same from becoming frayed or broken by any ordinary amount of wear, they yet will not impart undue stiffness or rigidity to the cable, because of the underlying bodies of resilient and slightly-elastic material—viz., the rubber wrapper *a* and slightly-elastic core *b*—which permit the outer wires to change their position to a slight extent when the cable is bent around the periphery of a pulley, thereby permitting such bending to be readily effected without strain upon the outer wires, and thus securing the desired flexibility—functions that cannot be fulfilled by a cable wherein heavy outer wires lie in direct contact with a body of rigid or non elastic or resilient material.

The principal advantages resulting from combining the outer portion or wrapper and inner portion or core with an intervening layer of rubber lie in the capacity of the cable to

bend or pass about small pulleys, as well as become slightly compressed between the jaws of the car-grip, thereby insuring a better hold of the latter upon the cable than could otherwise be obtained, but without presenting a core or body of too yielding a character. This action is illustrated in a somewhat exaggerated form in Fig. 3, in which the dotted lines represent a cable, and $b'$ $c'$ represent the opposite jaws of a grip, G, pendent in the usual manner from a street-car. As the jaws $b'$ $c'$ are brought together the elastic resilient portion $a$ will yield to a certain extent, so that when the cable is compressed between the jaws, and thereby slightly reduced in diameter, shoulders $x$ $x$ will be formed outside of and against the edges of the jaws, which operate to prevent the grip from slipping upon the surface of the cable and to insure a much firmer connection than would be practicable in cases where friction between the surfaces of the jaws and the cable alone is depended upon.

While the cable above described possesses the requisite flexibility and durability, the use of the heavy outer wires does not necessitate any undue increase in diameter, so that the improved cable has no greater cross-sectional area than one of the same strength made in the ordinary manner.

From the foregoing description it will be observed that my improved cable is especially adapted for use with cable railways, and can also be advantageously employed for any purposes requiring its use in connection with pulleys, especially where it is desirable that the cable be flexible as possible, in order to readily pass about the peripheries of pulleys of comparatively small diameter.

I claim—

1. A cable consisting of a non-extensible slightly-elastic and flexible core, a wrapper of rubber surrounding said core, and an external wrapper of large wire spirally arranged about said resilient wrapper, substantially as described.

2. A cable composed of a core formed of hemp or other slightly-elastic material inclosed by small wire, a wrapper of rubber surrounding said core, and an external wrapper inclosing said rubber wrapper, said external wrapper formed of large wire spirally arranged with regard to the longitudinal axis of the cable, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

COLIN M. THOMPSON.

Witnesses:
H. R. BALDWIN,
C. ED COPELAND.