

T. GORE.
DRILLING CABLE.
APPLICATION FILED FEB. 7, 1912.

1,055,326.

Patented Mar. 11, 1913.

Fig. 1.

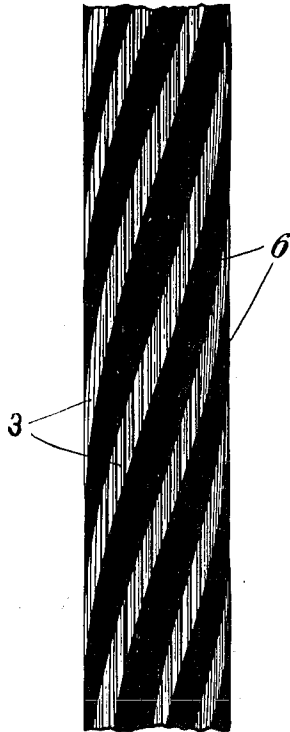
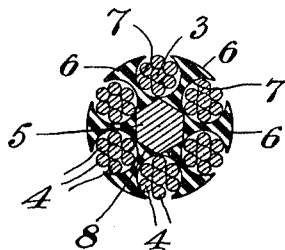


Fig. 2.



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UNITED STATES PATENT OFFICE.

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DRILLING-CABLE.

1,055,326.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed February 7, 1912. Serial No. 675,982.

To all whom it may concern:

Be it known that I, THOMAS GORE, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Drilling-Cables, of which the following is a specification.

The cable of my present invention is designed primarily for drilling purposes, and I will describe the same in that connection.

The drilling of "oil wells," etc., is usually accomplished by the raising and lowering of a drilling tool which is suspended on the end of a long cable, the cable being paid out as the bore increases in depth. It is a known fact that the cutting is due more to the sharp impact of the tool than to the mere weight of the tool, and hence the practice is to give the cable a "snap" at the end of each downward movement so as to throw the tool with percussive force into contact with the material. In order to get this "snap" at the end of the stroke the cable must be more or less elastic in its nature, for it is by the stretching and rebounding action of the cable that the snap is obtained. For this reason, Manila or fiber cables have usually been employed heretofore for drilling purposes, since these were the only cables possessing sufficient elasticity for the work. The use of Manila and fiber cables is, however, attended with certain difficulties and disadvantages—for instance if water is encountered the cable swells up and loses its elasticity. Then too these cables become frayed, and unravel; in some cases unraveling to such an extent as to choke up the bore. Steel cables, while possessing the necessary durability and being immune to the effects of water, nevertheless cannot be used successfully because they are not sufficiently elastic. It has been attempted to combine the advantages of the two different types of cable by attaching a so-called "cracker" of Manila cable (perhaps two or three hundred feet long) onto the end of a steel cable—but at best this is a make-shift and has not proven very satisfactory.

Having explained in a measure the diffi-

culties encountered in drilling work, I would state that the object of my invention is to secure in a single cable the strength and wearing qualities of a steel cable, together with the flexibility and elastic qualities of the Manila cable, so necessary to successful drilling operations.

Accordingly my invention consists in a preferred form of twisted substantially non-elastic strands, and cushions of elastic compressible material interposed between the strands. The strands are usually made up of twisted steel wires, and the elastic cushions are preferably in the form of strips of vulcanized rubber.

Various other objects and features of the invention will appear as the specification proceeds.

In the accompanying drawings I have illustrated my invention in a concrete and preferred form but I would have it understood that changes and modifications such as come within the scope of the appended claims may be made therein without departing from the spirit and scope of the invention. And I would state at this point also that while my invention is of particular utility for drilling purposes, I do not by any means intend to limit it to this particular purpose.

In the drawings: Figure 1 is an elevation of a section of rope or cable constructed in accordance with and embodying my invention. Fig. 2 is a transverse sectional view of the same.

According to my invention I construct the cable of a number of strands 3 which are combined in any suitable manner, preferably by twisting them, as indicated in the drawings. These strands constitute the body or loading-carrying portion of the cable and are therefore preferably made up of each of a series of twisted steel wires 4. The wires composing each strand may be combined in any suitable fashion and when both the individual wires and the strands themselves are twisted, the wires comprising the strands will preferably be twisted in one direction while the strands themselves will be twisted in the opposite direction. This

method of twisting the strands in a direction opposite to the "lay" of the individual wires has a tendency to balance the internal twisting tensions of the rope and prevent the rope from twisting or "spinning" too freely. The cable may or may not be provided with a core. In the preferred form it is provided with a core such as indicated at 5 in the cross-sectional view, around which the strands are laid.

The wire strands composing the body of the rope are substantially inelastic and incompressible in their nature, so that if no other means were provided, the cable itself would be so inelastic as to be unsuited for drilling and other like purposes for which it is intended. Accordingly I place between these substantially incompressible strands, cushions of elastic and compressible material. These cushions are preferably in the form of strips 6 which are laid in between the strands. These strips may be made of any suitable material, and the material which I have so far found best suited to this purpose is vulcanized rubber or rubber composition, and I have accordingly illustrated the strips as made of this material in the drawings. The cushioning strips may be made in different shapes and different means may be employed for securing the strips in position between the strands. In a preferred form the strips are made with oppositely facing concave sides 7 and with somewhat broadened base portions 8, so that as shown in Fig. 2, the strips will fill in the interstices between the strands and the broadened base portions of the strips will be interlocked beneath adjoining strands so as to secure the strips in place.

In order that the functions and operation of the cable may be fully understood, I would explain that the action of the cable is to be compared to that of a spiral spring. It is well known how when a drawing tension is placed on a spiral spring the convolutions of this spring will separate and the spring will "stretch" out. In the same way when the sudden tension is placed upon my cable, the strands will compress the interposed cushioning strips whereby a lengthening or stretching action of the cable will be produced, just as in the case of the spiral spring. Now when the tension is removed or lessened, the cushioning strips will expand back to their normal dimensions, thereby drawing the cable back to its true or normal length. This in brief is the manner in which the "snap" is produced when the cable is used for drilling purposes—the cable stretches out when the sudden strain is placed upon it and then rebounds under the expanding action of the cushioning strips.

The core 5 of the cable is preferably made

of Manila or other fibrous material, but if desired, greater resiliency in the cable may be secured by making this core of the same material as the cushioning strips, such as vulcanized rubber or rubber compound.

What is claimed, is:

1. A drilling cable composed of twisted wire strands, and strips of vulcanized rubber interposed between the strands and held in place by having their base portions interlocked between adjacent strands.

2. A drilling cable made up of wires twisted in one direction to form strands, said strands twisted together in a direction opposite to the "lay" of the wires to provide the body of the cable, and strips of elastic compressible material twisted in between the strands and secured in place between adjacent strands.

3. Means for adding elasticity to a cable of twisted substantially non-elastic strands, comprising strips of compressible elastic material twisted and secured in place between adjacent strands.

4. Means for adding elasticity to a cable of twisted substantially non-elastic wire strands, comprising strips of vulcanized rubber twisted in and secured in place between adjacent strands, whereby upon a heavy strain being applied to the cable the strips will be compressed by the strands and thus allow the strands to lengthen out somewhat, while upon lessening the strain the strips will expand to return the strands back to their normal twisted length.

5. A drilling rope composed of wires twisted together to form strands, the strands so formed being twisted together in a direction opposite to the "lay" of the wires to form the body of the cable, and strips of vulcanized rubber twisted in between the strands and secured in place therebetween to form cushions, which will, as a strain is placed upon the cable, be compressed by the strands, thereby permitting the strands to lengthen out somewhat, and will, upon the lessening of the strain, expand to restore the strands back to their normal twisted length.

6. A cable for drilling or like purposes comprising strands made up of twisted wires, the said strands being twisted together into a cable body, and strips of elastic cushioning material secured in place between the relatively non-elastic and non-compressible wire strands, whereby when a strain is placed upon the cable the elastic cushioning strips will be compressed by the relatively non-compressible strands to thereby permit the strands to lengthen out after the nature of a helical spring, and said cushioning strips rebounding upon relieving of the strain to restore the strands to their original twisted relation.

7. A relatively elastic drilling cable com-

prising substantially non-elastic strands
twisted together into a cable body, and
strips of compressible and elastic cushioning
material twisted in between the strands to
5 form spiral cushions separating adjacent
convolutions of the strands.

Signed in the borough of Brooklyn, New

York city in the county of Kings and State
of New York, this 1st day of February A. D.
1912.

THOMAS GORE.

Witnesses:

LEICESTER LOCKWOOD,
ROBERT J. SCHNEIDER.