Nov. 24, 1942. G. A. JOHNSON 2,303,281

ARMORED MARINE CABLE

Filed July 28, 1941

Fig. 1.

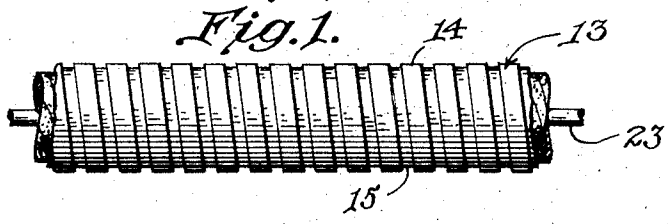
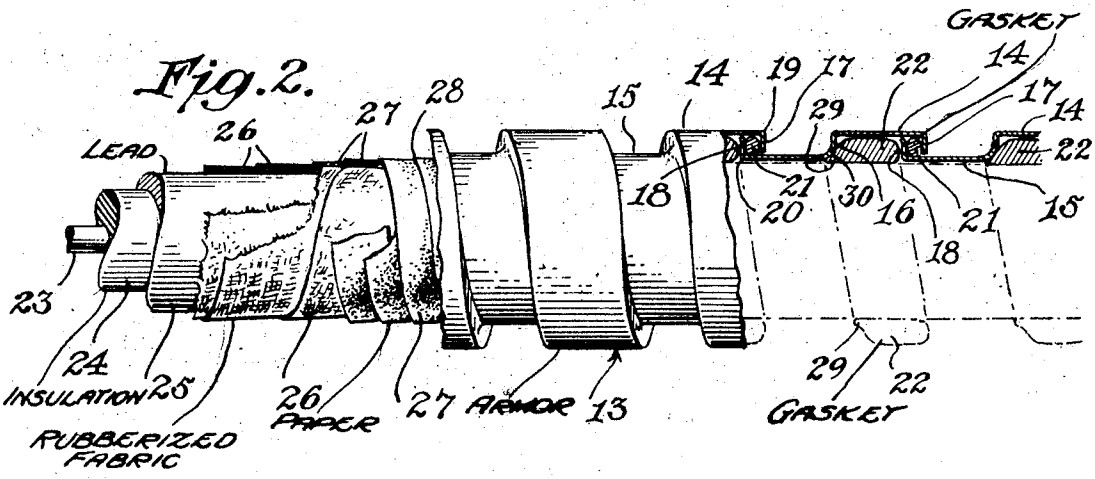


Fig. 2.



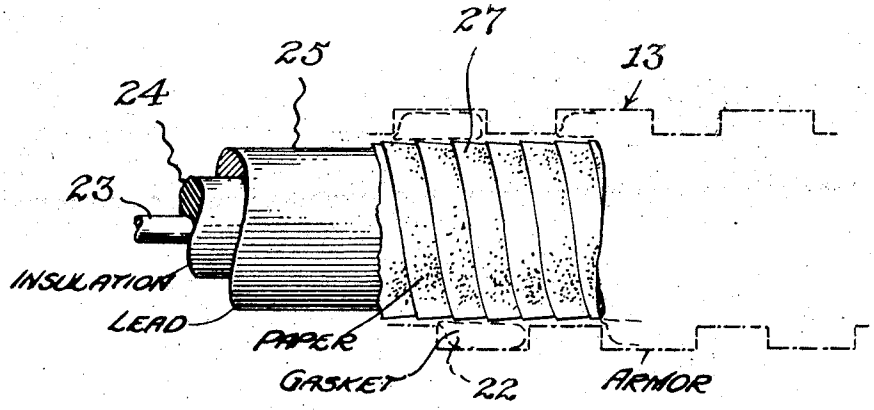


Fig. 3.

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ARMORED MARINE CABLE

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8 Claims. (Cl. 174—109)

This invention relates generally to flexible armored cables for installing on ships and in other situations in which the cable is exposed to water.

The principal object of my invention is to provide a flexible armored cable having a gasket of water-repellant materials wound about the cable in the armor and engaging the under surface of the armor to make the armor water-tight.

Another object of this invention is to provide a flexible armor having flexible means engaging the armor to limit longitudinal movement of the armor along the enclosed cable and thereby oppose the tendency of the armor to become unwound when subjected to tension along its length.

Another object of this invention is to provide an armored cable capable of meeting the exacting service conditions on ships, docks, and the like situations.

Other and further objects and features of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

This invention is illustrated in the drawing and hereinafter more fully described.

In the drawing:

Figure 1 is a side view in elevation of a length of armored cable with parts broken;

Figure 2 is an enlarged side view of a length of armored cable, with parts in elevation, parts in section, and parts cut away to show the disposition of material;

Figure 3 is a modification of the cable of Figure 2 with a side view showing parts in elevation and with parts cut away to show the disposition of material.

In Figure 2, there is shown a cable embodying the present invention, and in the figure the parts are enlarged to more clearly show their assembled relation.

The flexible armor tube 13 is made of a strip of bronze formed between dies to define a pair of channel forming portions connected by a neck and with each having a free terminal lip. When the formed strip is spirally wound about a cable, there is presented an outstanding portion 14 and a lower portion 15. Each portion has a terminating free lip, identified by the numerals 17 and 18, respectively, with the free lip 17 being inwardly directed, and the free lip 18 outwardly directed.

The portions 14 and 15 are connected by a neck 16.

It is conventional to leave an air space in the channel defined between the neck 16 and the inwardly directed lip 17 of the outer portion, or, more accurately, between the neck 16 and the outwardly directed lip 18 which lies adjacent or contiguous to the lip 17, and means will be described hereinafter to substantially fill this channel by a gasket.

A thread 21 of fibrous material, impregnated with a water-repellant compound, is placed between the lips 17 and 18 to substantially fill the space between them, and to substantially fill the corners 19 and 20, respectively, where the lips 17 and 18, respectively, bend from the body portions.

The tube 13 encloses a cable which is made up of a conductor 23, embedded in insulation 24, of rubber or other insulating material, a lead sheath 25 encasing the insulation, a layer of rubberized fabric 26 wrapped about the lead, and a layer of Kraft paper 27 wrapped about the fabric 26.

The rubberized fabric 26 has many of the characteristics of the well-known "friction tape," and it is to protect the layer 26 against being cut by slivers on the flexible armor, and to offer a relatively smooth surface material between the fabric and the armor that the layer of paper 27 is interposed between the fabric and the armor and is treated with asphaltum. The paper 27 is laid with overlapping edge portions, as indicated at 28. The paper 27 also tends to protect the surface of the fabric against deterioration in contact with air and gases.

The thread 21 is applied as the armor is being wound about the cable, and, at the same time, a relatively larger gasket of twine 22 is also applied to substantially fill the space between the neck 16 and the upturned lip 18, and is laid on the paper 27.

The gasket 22 may be of jute treated with a water-repellant material, or of some other flexible and water impervious material.

The gasket 22 may be shaped in the laying to provide an extending thin toe portion 29 to lie under the corner of the bend of the neck 16, as is indicated at 30.

In a modified form of the cable, as shown in Figure 3, the layer of rubberized fabric is omitted and the treated paper 27 is wrapped about the lead sheath. Since the paper is treated with asphaltum, it is tough and strong, and being overlapped it provides a wall of substantial thickness. The overlapped surfaces are treated with an adhesive.

It will be evident that the gasket 22 forms a packing substantially filling the space between

the neck 16 and the upstanding lip 18, and between the under surface of the upstanding body portion 14 and the surface of the paper 27, so that it cooperates with the gasket 21 to effectively prevent water from access laterally to the sheath, and to also prevent water from traveling longitudinally along the inner space between the armor and the paper.

It is well known that if the familiar B. X. cable is pulled there is the tendency for the meeting terminal lips to ride past each other, and that electricians can readily open the armor by giving it a slight pull and a slight twist by hand. It is also well known that if B. X. is roughly handled, the armor will open up and expose the cable.

It will be evident that the gasket 22 substantially locks the convolutions of the armor against opening up when the cable is roughly handled, and also substantially locks the convolutions of the armor against opening up when the cable is subjected to tension and twisting as the structural parts of a ship move and twist in a storm.

The gasket 22 has sufficient yieldability to permit of the cable being coiled and carried around bends of permissible radius.

The gasket 22, however, may be made of a material stiff enough to make the assembly semi-rigid for installations in which supports cannot conveniently be placed often enough along the length of the installed cable to give it adequate support against sagging.

What is claimed is:

1. A cable including a covering, a spirally wound tubular armor about said covering and bent to define a channel bounded by an inwardly directed neck and an inwardly directed terminal lip, an outwardly directed lip nested in said channel and positioned adjacent said inwardly directed lip, a first elongated spiral gasket of non-metallic and yieldable material seated on said armor and entered between said outwardly directed lip and said inwardly directed lip, and a second elongated spiral gasket of non-metallic yieldable and water-impermeable material on said covering and entered in said channel in engagement with said armor to provide an elongated seal between said covering and said armor.

2. A cable including a covering, a spirally wound tubular armor about said covering and having a portion bent to define a channel bounded by an inwardly directed lip and an inwardly directed neck which terminates in an inwardly positioned shoulder, and a gasket of non-metallic yieldable and water-impermeable material spirally wound on said covering and entered in said channel in sealing engagement with said armor and having a toe portion underlying said shoulder.

3. A cable including a covering and a spirally wound tubular armor having a portion bent to define a channel bounded by said covering and by a neck and a terminal lip, and a gasket of non-metallic and yieldable water-repellant fibrous material carried by said covering disposed in said channel in engagement with said armor to provide a seal between said armor and said covering.

4. A cable including a covering and a spirally wound tubular armor formed of a strip bent to define a pair of channel-defining portions connected by a neck and each portion having a terminal lip, and a gasket of non-metallic and yieldable moisture-resistant material carried by said covering and disposed in one of said channel portions and abutting said neck, said gasket being disposed providing a seal between said covering and said armor.

5. An electric cable including an insulated wire and a covering about said insulated wire, a flexible armor spirally wound about and housing said covering, said armor having means defining an elongated channel closed on one side by said covering, means providing a seal against ingress of water along said cable, said means comprising a spirally wound and upstanding gasket of non-metallic and yieldable water-repellent material seated on said covering and entered in said channel in engagement with said armor.

6. An electric cable including an insulated wire and a covering about said insulated wire, and elongated and spirally wound tubular armor housing said covering and bent to define a neck and a lip in longitudinally spaced relation to define an elongated channel closed on one side by said covering, and a spirally wound and upstanding gasket of non-metallic and yieldable and moisture-resistant material seated on said covering and entered in said channel, said gasket having a toe portion on only one side thereof disposed between said neck and said covering.

7. An electric cable including a conductor and a covering about said conductor, an elongated and spirally wound tubular armor housing said covering, means to provide a seal between said armor and said covering and to limit longitudinal movement of said armor relative to said covering, said means comprising channel-defining means on said armor and upstanding means of non-metallic yieldable and water-repellant material carried by said covering and entered in said channel-defining means in sealing engagement with said armor.

8. An electric cable including a conductor and a covering about said conductor, a spirally wound tubular armor housing said covering and having means defining an elongated channel and an air space between said covering and a spaced opposed portion of said armor, and elongated gasket means of non-metallic yieldable and substantially water-impermeable material entered in said channel and engaging said cover and said armor to provide a seal between said armor and said covering.

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