

[72] Inventors **John C. Jenkins**
Lorain, Ohio;
William O. Wesseler, Bremerton, Wash.
[21] Appl. No. **750,505**
[22] Filed **Aug. 6, 1968**
[45] Patented **Jan. 19, 1971**
[73] Assignee **TRW Inc.**
Cleveland, Ohio
a corporation of Ohio, by mesne
assignments

1,963,436	6/1934	Dumke	24/269
2,671,937	3/1954	Finke	24/269X
2,939,664	6/1960	Wesseler	248/68
2,964,274	12/1960	Richardson	248/68
3,334,851	8/1967	Cassidy	248/68
2,519,921	7/1950	Mocke	211/119.15

FOREIGN PATENTS

345,145 12/1936 Italy

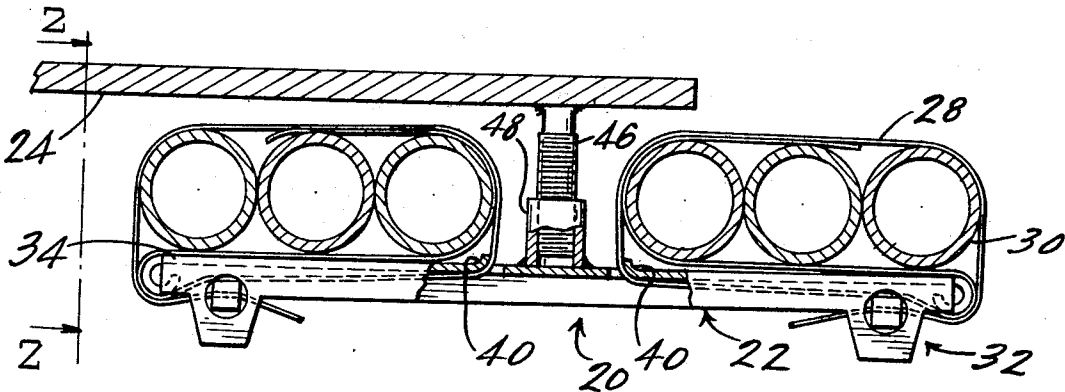
Primary Examiner—Chancellor E. Harris
Attorneys—Philip E. Parker & James R. O'Connor, John
Todd, Hall & Houghton and Gordon Needleman

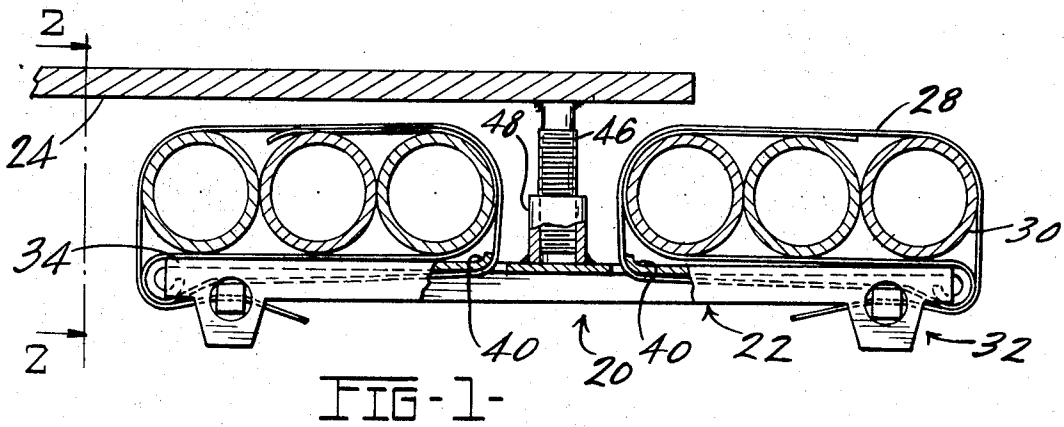
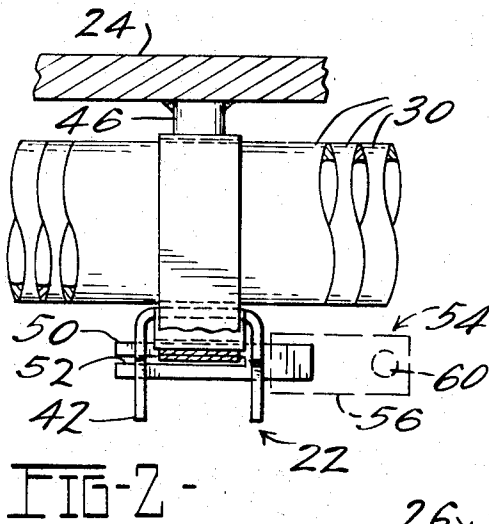
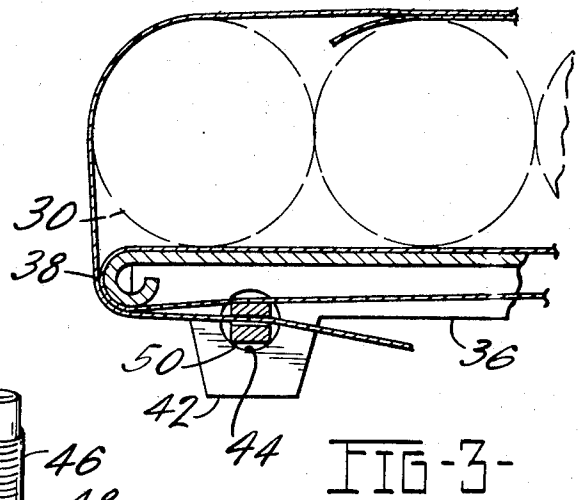
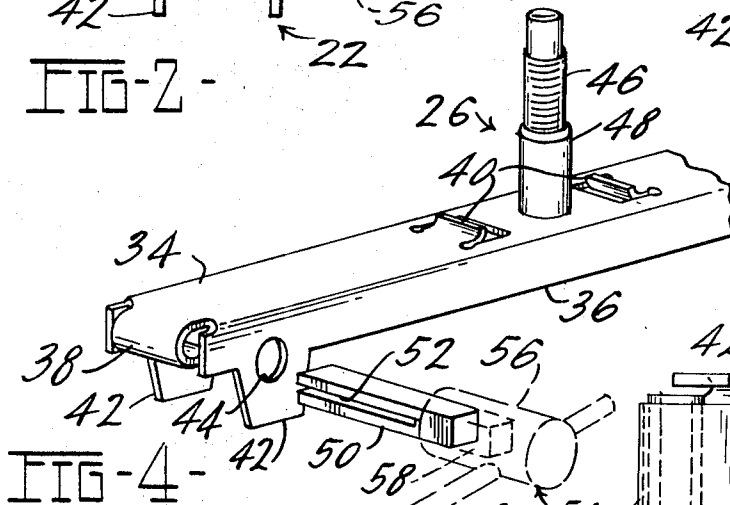
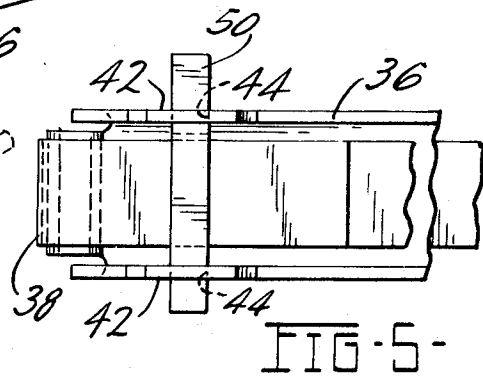
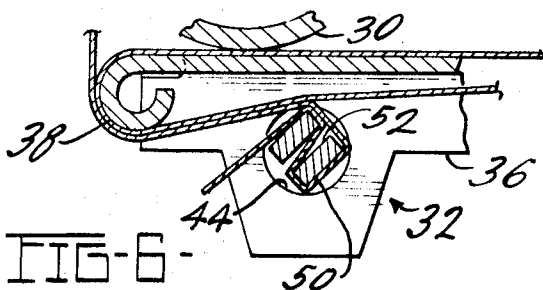
[54] **SUPPORT FOR ELONGATE MEMBERS**
2 Claims, 21 Drawing Figs.

[52] U.S. Cl. **248/62,**
24/269, 248/68
[51] Int. Cl. **F16I 3/22**
[50] Field of Search 248/62, 68,
74; 24/269

[56] **References Cited**
UNITED STATES PATENTS
1,596,193 8/1926 Kuhlman 24/269X

ABSTRACT: A cable hanger assembly particularly useful on ships includes an elongate supporting hanger extending transversely of the cables and in engagement therewith. A band is wrapped around the cables and at least part of the hanger and is held in tension by means of a slotted shaft which engages the band with a portion of the band being wound on the shaft by a small wrench. The cables can be installed on the hanger in a small space and without special skill or training being required.

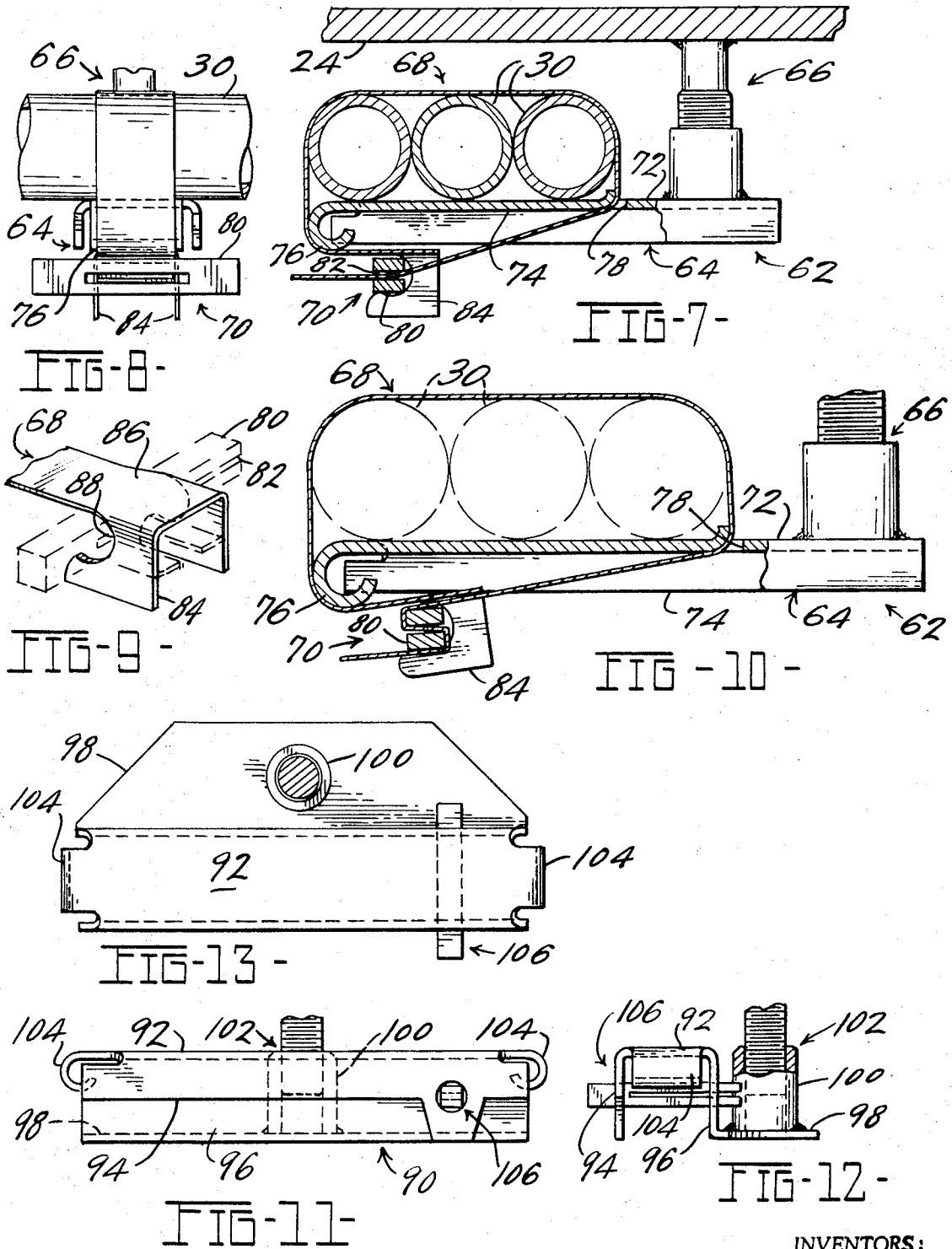




INVENTORS:
J. C. JENKINS,
W. O. WESSELER.

BY

W. O. Wesseler
ATT'YS.

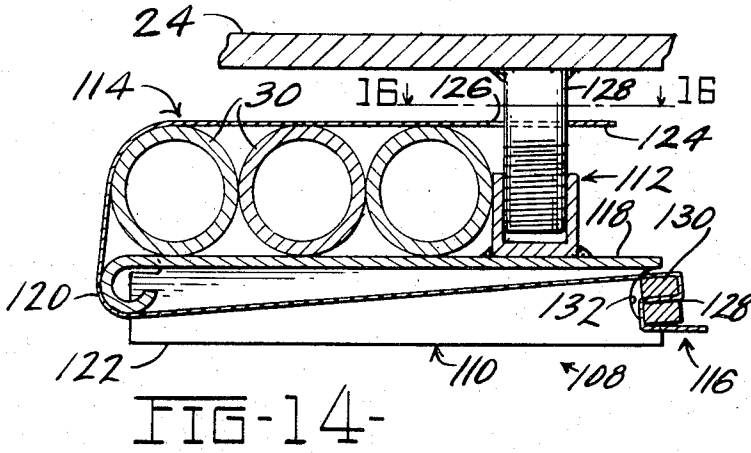
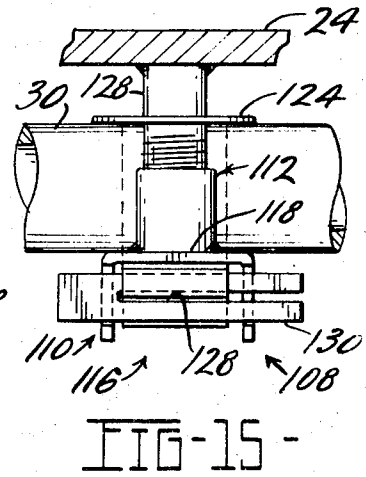
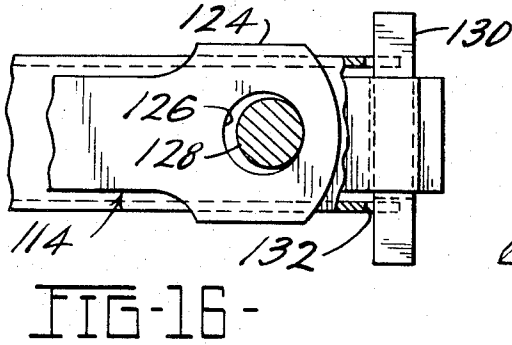
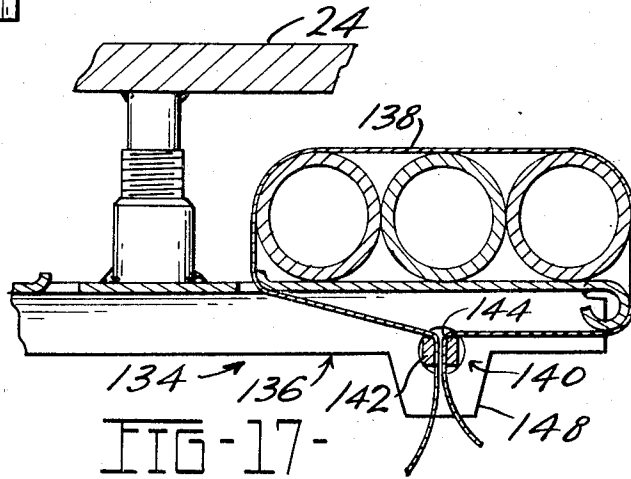
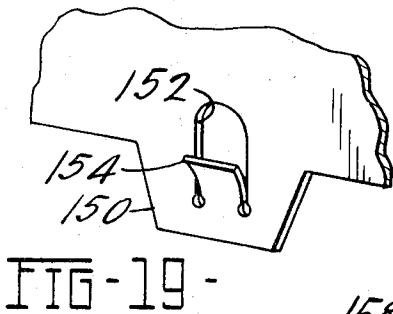
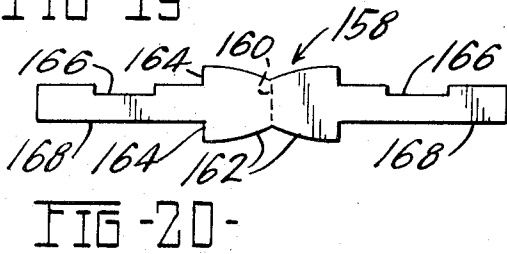
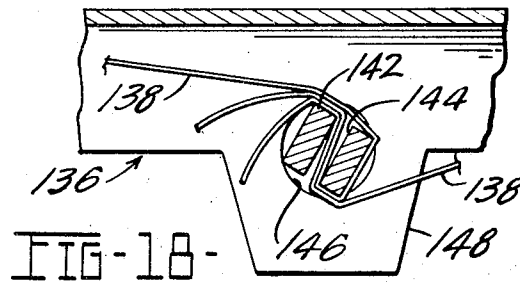
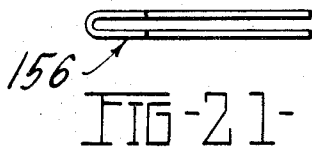


INVENTORS:
J. C. JENKINS,
W. O. WESSLER.

BY

Eden Eden

ATT'YS.



INVENTORS:
J. C. JENKINS,
W. O. WESSELER.

BY

Deu & Deu
ATT'YS.

SUPPORT FOR ELONGATE MEMBERS

This invention relates to a support for elongate members and particularly to a hanger assembly for supporting cables or the like on a ship or in industrial applications.

Numerous cable and pipe hangers are known in the art, including a type in which the cable or pipe is held by a band encircling the cable and a support. Heretofore, the bands for the hangers have required special tools for fastening and tensioning. These tools have had long handles making it difficult to properly fasten the bands in some locations on the ship where space is limited. Further, the proper manipulation of such tools by an operator has required both considerable skill and experience in order to achieve the proper tension in the band. Other banded-type cable supports have used bands in the nature of hose clamps which are tightened by means of a screwdriver. However, such bands are relatively expensive, requiring a special perforate banding and special screw mechanisms engageable with the perforations for tightening purposes.

The present invention provides a hanger assembly for cables or pipes which overcomes the above problems. The hanger assembly according to the invention incorporates a band which is wound around the cables or other elongate members on the hanger support, with the band then held in tension by a shaft which can be turned by a simple wrench or key. The key thereby wraps a portion of the band around the shaft and holds the band in tension, without any additional fastening being required. In a preferred form, a slotted shaft to receive the band is held by a portion of the hanger support, extending through suitable openings formed in flanges thereof. However, the shaft can also be supported by openings formed in a portion of the band itself or can be engaged with two spaced portions of the band which are then wrapped together in which case no support for the shaft may be necessary.

The hanger according to the invention can be installed in almost any location since the key required to turn the shaft can be of small, compact size. Further, the band can be tightened effectively by an operator having little skill or experience.

It is, therefore, a principal object of the invention to provide a hanger for elongate members which can be installed without special skill or experience.

Another object of the invention is to provide a hanger for elongate members on ships or the like which requires a minimum amount of space for installation.

Still another object of the invention is to provide a hanger for elongate members which is relatively simple and inexpensive.

A further object of the invention is to provide a hanger which is highly resistant to shock and vibration.

Many other objects and advantages of the invention will be apparent from the following detailed description of preferred embodiments thereof, reference being made to the accompanying drawings, in which:

FIG. 1 is a view in elevation, with parts broken away and with parts in section, of a cable hanger assembly embodying the invention with cables shown in cross section;

FIG. 2 is a left end view in elevation of the cable hanger assembly taken along the line 2-2 of FIG. 1;

FIG. 3 is an enlarged, fragmentary view in vertical longitudinal cross section of an end portion of the hanger assembly of FIG. 1;

FIG. 4 is a fragmentary view in perspective of a portion of the hanger assembly of FIG. 1, when partially assembled;

FIG. 5 is a bottom view of the end portion of the cable hanger assembly shown in FIG. 3;

FIG. 6 is an enlarged, fragmentary view in cross section showing a clamping band of the hanger assembly in tension;

FIG. 7 is a view in elevation, with parts broken away and with parts in section, of a slightly modified cable hanger assembly employing a modified tensioning device;

FIG. 8 is a left end view in elevation of the hanger assembly of FIG. 7;

FIG. 9 is a view in perspective of a portion of the tensioning device employed with the hanger assembly of FIGS. 7 and 8;

FIG. 10 is an enlarged view, with parts broken away and with parts in section, of the hanger assembly of FIG. 7 with the clamping band shown in tension;

FIG. 11 is a view in elevation of a modified cable hanger employing the tensioning device of FIGS. 1-6;

FIG. 12 is a right end view of the hanger of FIG. 11;

FIG. 13 is a top view of the hanger of FIGS. 11 and 12;

FIG. 14 is a view in longitudinal, vertical cross section of a modified cable hanger assembly, including a modified tensioning device;

FIG. 15 is a right end view of the hanger assembly of FIG. 14;

FIG. 16 is a fragmentary view, with parts broken away, taken along the line 16-16 of FIG. 14;

FIG. 17 is a fragmentary view in longitudinal, vertical cross section of a slightly modified hanger assembly with a modified tensioning device;

FIG. 18 is an enlarge, fragmentary view in sections section showing the tensioning device of FIG. 17;

FIG. 19 is a fragmentary view in perspective of a modified flange for a cable hanger according to the invention;

FIG. 20 is a front view of a shaped metal sheet for forming a modified tensioning shaft; and

FIG. 21 is a plan view of a shaft formed by bending double the metal sheet of FIG. 20.

Referring to FIGS. 1-6 and particularly to FIG. 1, a cable hanger assembly 20 embodying the invention includes a cable hanger 22 connected to a supporting surface 24, shown as an overhead, by partable connector 26. The hanger assembly 20 also includes a flexible band or strip 28 extending around cables 30 and held in tension by a tensioning device 32.

The cable hanger 22, in this instance, carries two runs of the cables 30 on each side of the connector 26. The hanger includes an elongate channel-shaped member having a flat web portion 34 and depending flanges 36. The ends of the flat portion 34 are turned downwardly in lips 38 and slots 40 are formed at intermediate portions, adjacent the connector 26. The flanges 36 have extensions 42 in which openings or holes 44 are formed.

The connector 26 can be of any suitable type and, as shown, includes a threaded male stud 46 which is end-welded to the supporting surface 24 by a known stud-welding technique. A female, internally-threaded stud 48 is centrally end-welded to the flat portion 34 of the hanger 22. This can be done in the shop prior to field assembly of the hanger. After the stud 46 is welded to the supporting surface 24 in the ship, the hanger 22 is simply turned onto the stud 46 by hand until the female stud 48 is finger tight, after which the hanger can be tightened by a tool to the desired position in which it is transversely positioned with respect to the cable runs.

The tensioning device 32 includes a rotatable member or shaft 50 which has a slot or passage 52 in which a portion of the band 28 is received when the shaft 50 is extended through the openings 44 in the flange extensions 42. As shown, the slot or opening 52 extends to the end of the shaft 50, which enables the shaft 50 to be pulled out of the opening 44 to separate it from the band 28 in the event the cable hanger assembly 20 is to be disassembled. However, the slot 52 can stop short of the end of the shaft 50 where disassembly is of less concern, which enables the shaft 50 to be stronger. The shaft 50 is turned by a key or wrench 54 which includes a body 56 having a noncircular opening 58 therein to receive the shaft 50 in nonrotatable relationship. The wrench 54 further has a handle 60 to facilitate turning of the shaft 50.

When the cables 30 are placed on the flat portion 34 of the hanger 22, the band 28 is wrapped around the, as best shown in FIG. 1. An end portion of the band is above the cables and the band is then directed between the cables and the flat portion 34 of the hanger. The band then curves around the lip 38 and extends upwardly through the slot 40 and around the upper portion of the cables again. Finally, the band bends around the lip 38 and is engaged in the slot 52 of the shaft 50. The shaft 50 is turned by the wrench 54 to wind the band therearound, as shown in FIG. 6, placing the band in tension

and securely holding the cables 30 in place. The band 28 is flexible but has little resiliency so that when bent, its position is substantially retained. Consequently, when the band is wound as shown in FIG. 6, it may remain in that position without requiring a locking device for the band or the shaft. However, the flanges 42 can be bent inwardly to bind the shaft 50 and further aid in the prevention of turning, particularly when the hanger may be subjected to shock.

Referring to the embodiment of FIGS. 7-10, a cable hanger assembly 62 includes a modified cable hanger 64, a connector 66, a modified band 68, and modified tensioning device 70. The cable hanger 64 supports only one run of the cables 30 and has an upper flat portion 72, flanges 74, a lip 76, and a slot 78.

The connector 66 can be the same as shown in FIG. 1 or the male and female studs can be reversed. Other suitable arrangements also can be made for connecting the hanger 64 to the overhead or other supporting surface 24.

The tensioning device 70 includes a shaft or rotatable member 80 which can be similar to the shaft 50 with a slot or opening 82 therein. In this instance, however, flanges or ears 84 are formed at an end portion 86 of the band 68, as shown in FIG. 9, with the flanges forming openings or notches 88 facing away from the end of the band. The flanges 84 can be structurally integral with the band 68 or fastened thereto as by welding, etc. The band 68 can be wrapped around the cables 30 on the flat portion 72 of the hanger once, as shown, or more than once, if greater strength is required. The free end portion of the band 68 is then passed through the opening 82 of the shaft 80, as shown in FIG. 7, between the flanges 84. The shaft 80 is rotated, by means of the wrench 54 or a similar device, to wrap the band therearound and place it in tension, as shown in FIG. 10. Afterward, the outer edges of the flanges 84 can be bent inwardly, approximately as shown in the dotted line position of FIG. 9, to hold the band more securely in place, although this is not usually required.

The connector for supporting the cable hanger from a supporting surface can be located centrally of the hanger to eliminate the overhang of the cable carried by hanger 64. An embodiment of this type is shown in FIG. FIGS. 11-13. In this instance, a cable hanger 90 of elongate, channel-shaped configuration has a flat portion 92, and a front flange 94, and a deeper, rear flange 96. A flat flange or tab 98 extends rearwardly from the lower edge of the rear flange 96 to which a female stud 100 of a connector 102 is affixed. The flat portion 92 terminates in two lips 104 around which the band extends with the band held in tension by a tensioning device 106 similar to the tensioning device 32 of FIGS. 1-6. A single run of cables is held by the hanger 90 and the band, with the connector 102 extending between two of the cables in the run.

Referring to FIGS. 14-16, a modified cable hanger assembly 108 includes a modified cable hanger 110, a connector 112, a modified band or strap 114, and a modified tensioning device 116. The cable hanger 110 is basically similar to the hanger 64 of FIG. 7, including a flat portion 118 having a lip 120 and side flanges 122. The band 114 has an enlarged end 124 with a central opening 126 which is received on a threaded stud 128 of the connector 112. The band 114 extends around the cables 30 and the lip 120 to the opposite end of the hanger 110. At this point, the free end of the band 114 is received in an opening 128 of a rotatable member or shaft 130 forming part of the tensioning device 116. The shaft 128 is supported in openings or notches 132 of the side flanges 122 when the shaft 128 is turned by a suitable wrench or key to place the band 114 in tension. With this design, the band 114 must be specially shaped, but it is substantially shorter since it need not extend even once completely around the hanger 110.

Referring to FIGS. 17 and 18, a modified cable hanger assembly 134, as shown, includes a cable hanger 136 which can be similar to the hanger 22 of FIG. 1, for example. The hanger assembly also includes a band 138 which can be similar to the band 28 of FIG. 1, but somewhat shorter. A tensioning device 140 includes a shaft or rotatable member 142 which has an opening or passage 144 therein of sufficient size to receive

both end portions of the band 138. The shaft 142 is shown as held in the openings 146 of flange portions 148 which are centrally located under the cable run.

A modified flange portion 150 of a cable hanger has means for mechanically locking a shaft or rotatable member, such as any of those heretofore illustrated, after the shaft has tightened the band around the cables supported on the hanger. Accordingly, the flange 150 has a generally D-shaped opening 152 therein having a generally semicircular upper edge portion and having a lower edge portion defined by a locking tab 154 which is integral with the flange 150 and bends outwardly from the plane of the flange. The dimensions of the opening 152 are such that the shaft can be rotated in the opening when the tab 154 is bent from the plane of the flange. When the hanger assembly is assembled, the shaft is rotated by the wrench in the usual manner until the band reaches the desired degree of tension. At this point, by use of a simple tool, such as a pair of pliers, the tab 154 is bent back to the plane of the flange 150 with the upper edge of the tab then cooperating with a flat side of the shaft to mechanically prevent any rotation of the shaft, whereby the band is held securely in its tightened state.

FIGS. 20 and 21 show a rotatable member or shaft 156 which can be stamped from a single sheet 158 of metal. The sheet is folded along a line 160 to form the shaft 156. As shown, the sheet 158 has enlarged portions 162 which limit the extent of movement of the shaft into the opening of the cable hanger flange, the enlarged portions having shoulders 164 which abut the outer surface of one of the flanges. The sheet also has notches 166 which receive the band when tightened therearound and prevent the possibility of the shaft from slipping out of the band due to vibration. Further, the sheet has end extensions 168 which protrude through the opening in the opposite flange of the cable hanger and receive the key or wrench in the usual manner for tightening purposes.

It will be seen that the cable hanger and the tensioning device of the embodiments heretofore discussed can be assembled and the band placed in tension even by an operator or workman having had no previous experience in the assembly of such hangers. Further, the wrench used to operate the rotatable member for placing the shaft in tension is simple, compact, and can be used in a small space. The cable hanger assembly also is capable of securely holding the cables even under conditions of shock or impact, and yet is of relatively simple, low-cost construction.

Various modifications of the above-described embodiments of the invention will be apparent to those skilled in the art, and it is to be understood that such modifications can be made without departing from the scope of the invention, if they are within the spirit and tenor of the accompanying claims.

I claim:

1. A cable hanger assembly for supporting a plurality of cables from a supporting surface of a ship, said cable hanger assembly comprising a hanger having an elongate flat portion extending transversely to the cables and having a surface on which the cables are supported, a flexible, metal band of sufficient length to extend completely around the cables and at least that portion of the flat portion of said hanger on which the cables are supported, and a rotatable tensioning shaft located on the side of said hanger opposite the surface on which the cables are supported and engaged with a portion of said band to wind the band portion around said shaft and place said band in tension, said shaft having a noncircular end portion for engagement by a wrench to facilitate turning of said shaft by an operator, said hanger having a flange on the same side of said hanger as said rotatable shaft, said flange having an opening through which said shaft extends, said flange further having a tab portion contiguous with said opening when in the plane of said flange to cooperate with said rotatable member and to prevent rotation thereof.

2. A cable hanger assembly according to claim 1 wherein said opening is substantially of D-shaped configuration and said rotatable member is rectangular in transverse cross section.