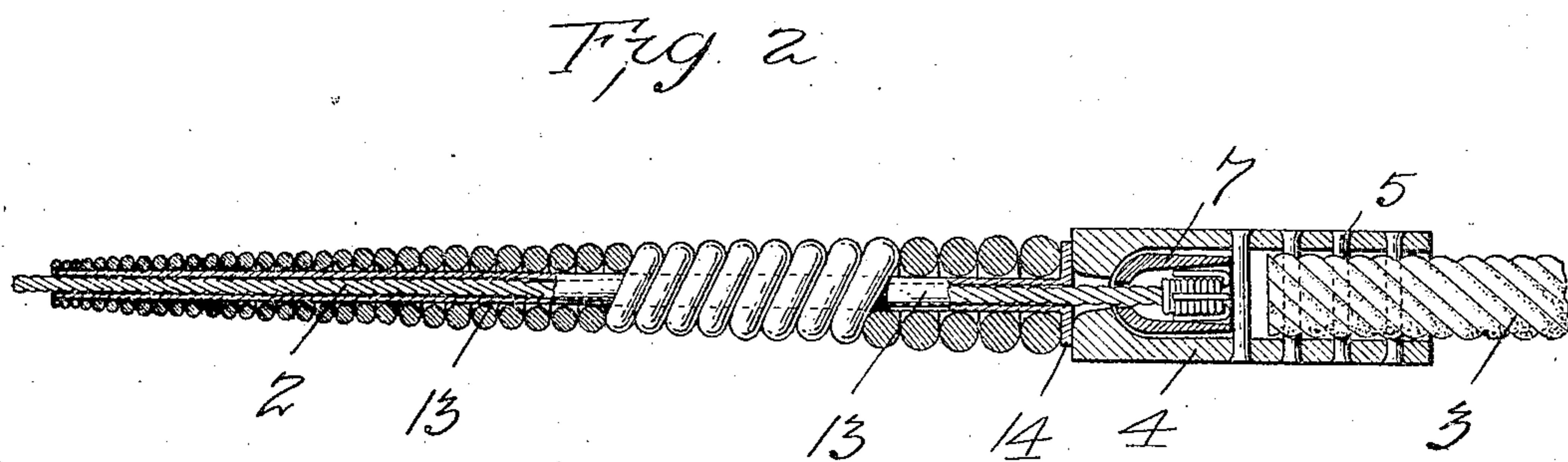
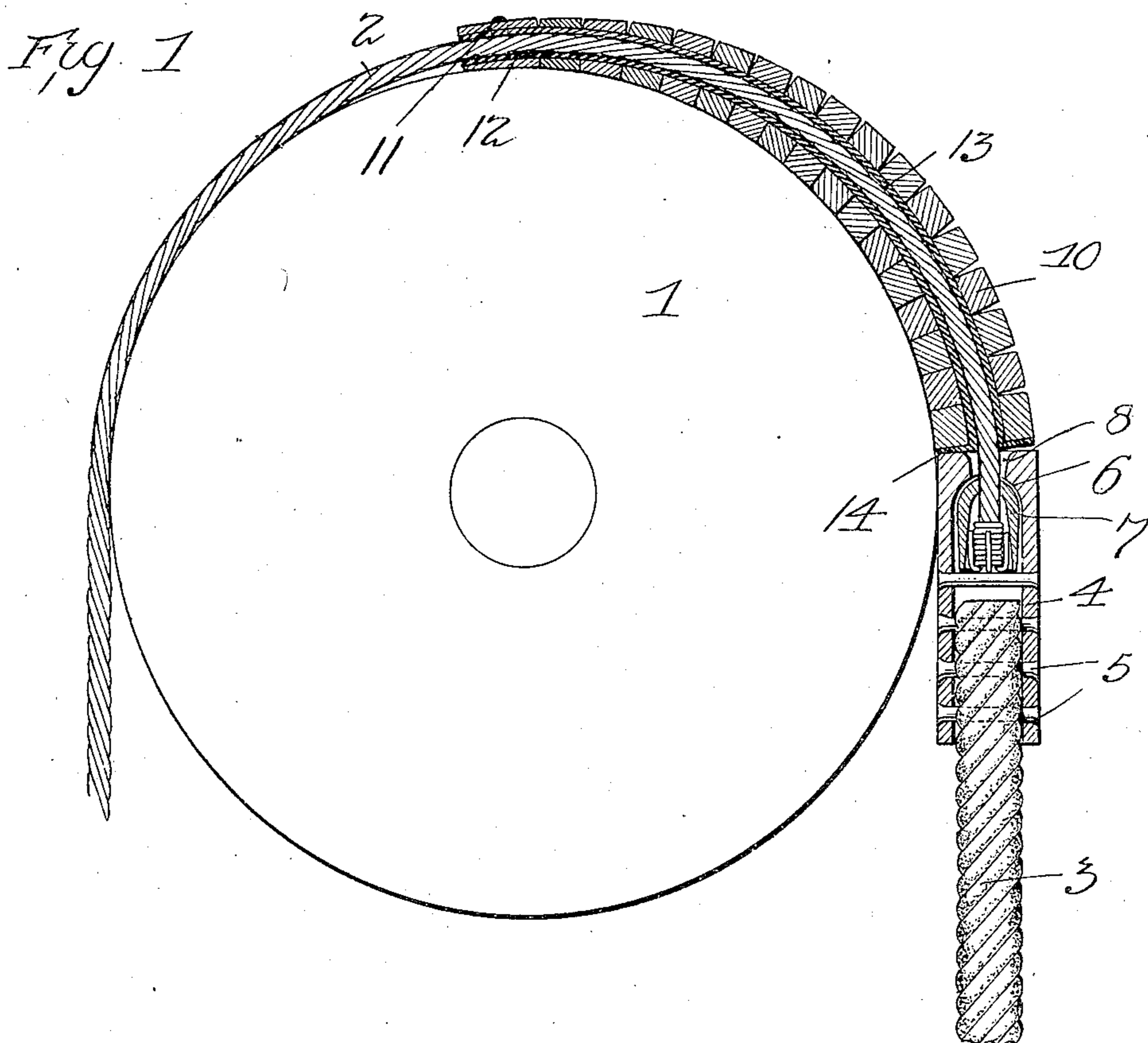


No. 836,882.

PATENTED NOV. 27, 1906.

R. J. HOFFMAN.  
POWER TRANSMISSION CONNECTION.  
APPLICATION FILED NOV. 24, 1905.



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# UNITED STATES PATENT OFFICE.

ROSS J. HOFFMAN, OF BRADFORD, PENNSYLVANIA.

## POWER-TRANSMISSION CONNECTION.

No. 836,882.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed November 24, 1905. Serial No. 288,964.

*To all whom it may concern:*

Be it known that I, ROSS J. HOFFMAN, a citizen of the United States, residing at Bradford, Pennsylvania, have invented certain  
5 new and useful Improvements in Power-Transmission Connections, of which the following is a specification.

My invention relates to power-transmission means—such, for instance, as is used in  
10 the drilling of wells, where the drilling-tools are operated by a rope or flexible connection extending up therefrom over a drum or pulley to the power or driving device. In such situations it is desirable to employ a flexible  
15 connection made up in part of a hemp or Manila rope and in part of a wire rope, which are coupled together at their meeting ends. It has been found in practice that the wire rope being unsupported between the point at  
20 which it leaves the coupling and the point at which it bears upon the surface of the drum or pulley bends sharply and being at this point subjected to constant flexing action soon becomes broken, and thus renders the  
25 loss of the tools liable to occur and entailing much trouble and expense. To remedy this, I provide a flexible sheath for the wire rope tapering from the point of coupling between the wire and Manila ropes down to substantially the same diameter as the wire rope,  
30 whereby the wire rope is prevented from making a sharp bend; but, on the contrary, it extends in a curve of large radius from the coupling to the drum.

35 The invention consists in the features, combination, and arrangement of parts hereinafter described, and particularly pointed out in the claims.

40 In the drawings, Figure 1 is a sectional view of the invention in the position assumed by it when passing around the drum or pulley. Fig. 2 is a sectional view of the coupling in its straight position and showing also a different form of sheath or supporting means for the wire rope—namely, a coil of wire—this  
45 view being partly in section and partly in elevation.

In the drawings, 1 indicates a drum or pulley which is usually placed at the top of the  
50 derrick of the drilling apparatus and over which the rope passes, which is attached at one end to the drilling-tool and at the other end to the driving means. This rope I show as composed of a wire-rope section 2 and a  
55 section 3 of Manila rope or hemp, the latter being desirable in connection with the tool

in order to supply the desired amount of resilience or spring when the drilling-machine is in operation. The coupling between these ropes consists of a sleeve 4, having a large opening in one end in which a Manila rope fits and  
60 wherein it is held by cross pins or rivets 5. The other end of the coupling-sleeve has a smaller opening to receive the wire rope, and it has its interior rounded at 6 to afford a  
65 bearing for a boss or enlargement 7, to which the wire rope 2 is connected. The said wire rope extends from the said enlargement or boss out through the flaring opening 8 in the end of the sleeve. In order to allow rocking  
70 movement of the boss or enlargement, it is rounded on its outer side to fit the rounded surface 6, and it is also tapered, so as to leave a free space between it and the inner wall of the sleeve for the necessary lateral move-  
75 ment of the boss when the wire rope is flexed in different directions. It will be noticed from Fig. 1 that the point at which the wire rope enters the coupling is raised or off some distance from the periphery of the drum or  
80 pulley 1, and in practice should the wire rope be allowed to extend straight from the coupling to the periphery of the drum the sharp bend or deflection resulting would, owing to the constant flexion to which the wire rope is  
85 subjected, cause the same to break down at this point. In order to prevent this and at the same time allow for the perfect freedom of movement in all directions of the wire rope, I provide a series of rings 10 on the  
90 wire rope, those near the coupling being of sufficient diameter to reach from the wire rope to the surface of the pulley or drum, and thus firmly support the wire rope, the said rings or sections being gradually reduced in  
95 diameter, according to their distance from the coupling, to form, in effect, a tapered supporting-sheath, which at its smaller end is substantially of the same diameter as the wire rope and which throughout its extent  
100 furnishes a support for the wire rope adapted to be bent in any direction. From this construction it will be seen that no sharp bend will occur in the wire rope; but, on the contrary, it extends in a long gentle curve from  
105 the coupling to the surface of the drum or pulley. The sections 10 are slightly beveled on their lateral faces, so as to permit the rocking movement of one in relation to the other. The tapered sheath I may secure to  
110 the wire rope in any suitable way, and I have shown as one way of doing this a set-screw

11 passing through the elongated end member 12 of the sheath to bear upon the wire rope. I do not limit myself, however, in this respect, as modification from this mode of fastening may be made within the scope of the appended claims.

Within the series of rings or sections forming the flexible sheath I prefer to arrange a tube or sleeve of leather 13, surrounding the wire rope and flanged at its end 14. This sleeve provides a cushioning effect between the metallic sections and the wire rope, adding to the life of all of these parts. Another function that the leather sleeve or tube performs is to hold the section of the sheath together when removed from the wire rope, so that they will be in proper positions for replacing as one body or for handling as one body. Instead of securing the end section by means of a set-screw it may simply be driven onto the end of the leather or other resilient sleeve or tube, so as to maintain itself by frictional contact.

Reverting again to the boss or enlargement 7, it will be seen that the wire rope is secured thereto by having its strands separated and turned back over the rope, so as to fit within the tapered interior of the said boss or enlargement.

I do not wish to limit myself to the precise form of sheath shown, made up of separate section-plates, as I may, for instance, employ a sheath made up of a coil of wire, as shown in Fig. 2, this coil of wire tapering toward one end in a manner similar to that above described. In this form also I prefer to employ an inner sheath or tube of some cushioning material—such, for instance, as leather.

While I have shown the tapered sheath only on one side of the coupling-sleeve, I do not limit myself in this respect, as will be seen by the scope of the appended claims.

Any other material than metal may be used to form the sheath.

I claim as my invention—

1. In combination in a power-transmission connection, the rope-sections of different di-

ameters, a coupling connecting them and a tapered flexible sheath on the smaller section adjacent the coupling and adapted to bear on the pulley or drum, substantially as described.

2. In combination with the pulley the flexible rope, a part to which the rope is connected, said part being of larger diameter than said rope, a flexible tapered sheath on the rope tapered to bear on the pulley or drum, said rope being connected with the part of larger diameter adjacent which the tapered sheath lies, substantially as described.

3. In combination with two rope-sections of different diameter, a coupling-sleeve connecting them, the boss on the rope-sections of smaller diameter fitting in said coupling-sleeve and a flexible tapered sheath extending along the said smaller section and tapered to bear on the pulley or drum, substantially as described.

4. In combination the pulley or drum, the rope, the coupling member connected therewith and a tapered metallic flexible sheath extending along the said rope from said coupling member to bear on the pulley or drum, the larger end of the tapered sheath being adjacent the coupling member, substantially as described.

5. In combination the rope, the flexible metallic sheath tapered from one end to the other, the coupling member connected with the rope and adjacent which the larger end of the sheath lies and a cushioning sleeve or tube within the flexible sheath and surrounding the rope, substantially as described.

6. In combination the rope, a flexible tapered sheath surrounding the same, a cushioning-sleeve between said sheath and rope, said sleeve being flanged at one end, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROSS J. HOFFMAN.

Witnesses:

HENRY E. COOPER,  
C. S. MIDDLETON.