Nov. 27, 1934. W. J. MILLER 1,982,444

LINE TIGHTENER

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Fig. 1.

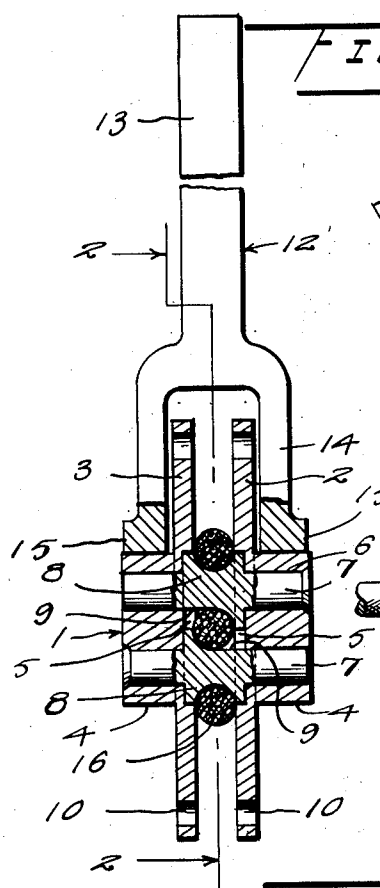


Fig. 2.

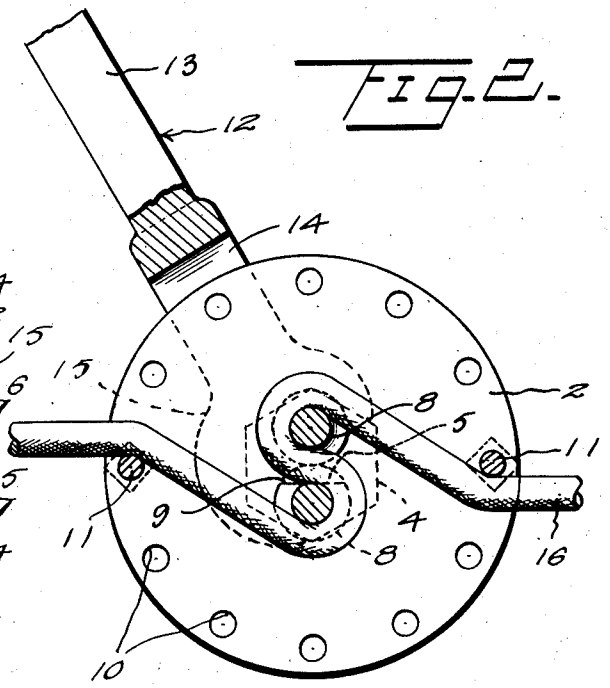


Fig. 5.

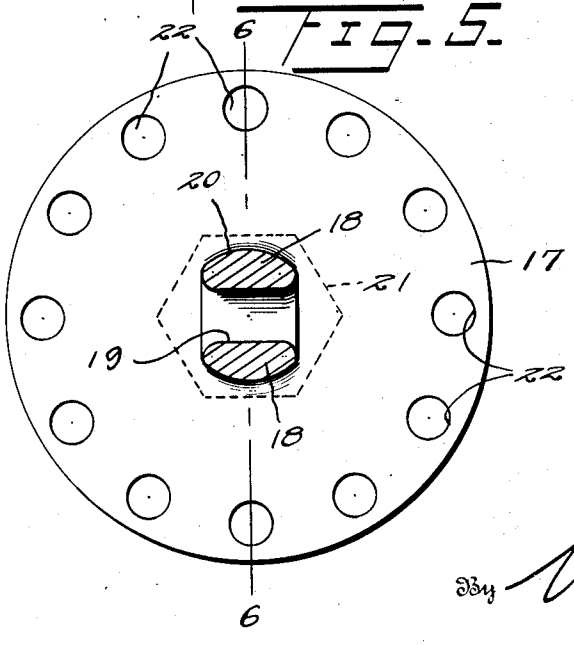


Fig. 3.

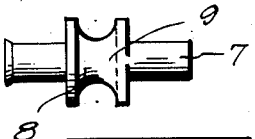
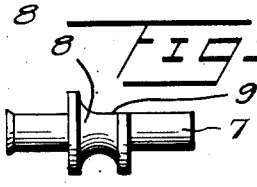


Fig. 4.



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Fig. 6.

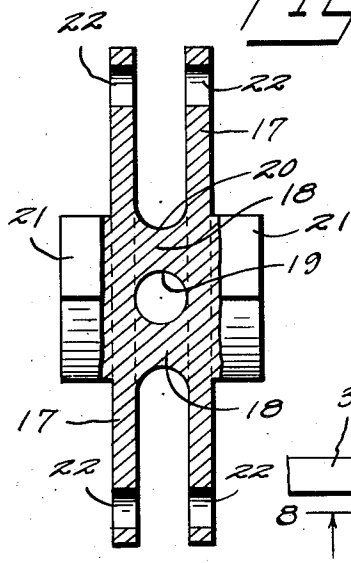


Fig. 7.

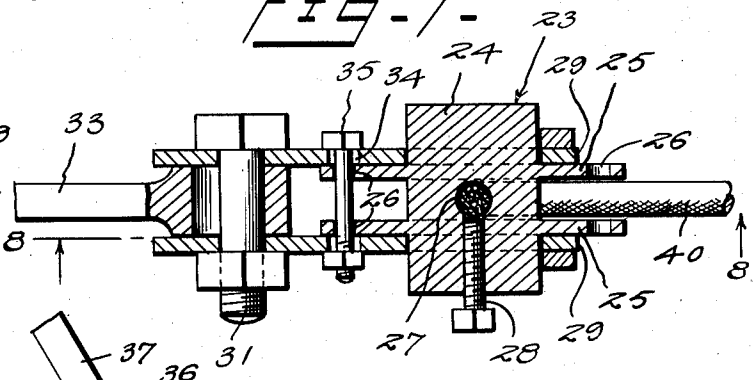


Fig. 8.

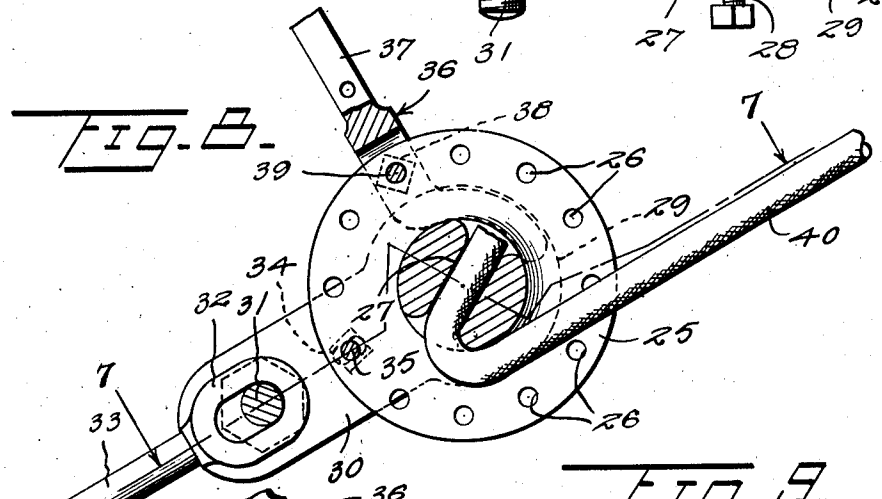
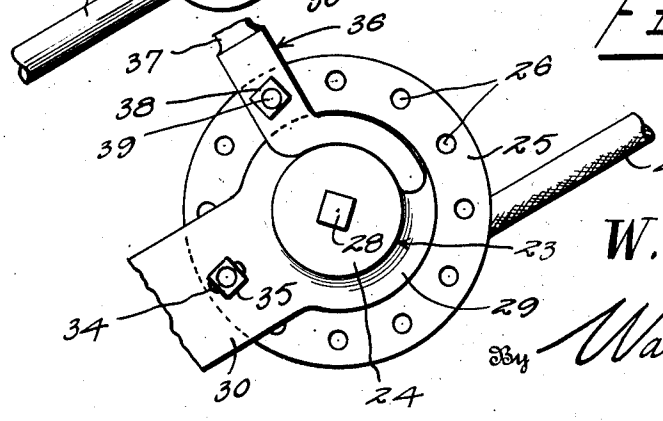


Fig. 9.



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1,982,444

LINE TIGHTENER

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Application November 28, 1933, Serial No. 700,140

8 Claims. (Cl. 24—71.2)

This invention relates to improvements in line tightening devices and pertains particularly to a device designed for tightening guy wires and all other types of wires or lines which connect two bodies together.

The primary object of the present invention is to provide a line tightener which is of simple design and inexpensive to manufacture and which may be easily manipulated to draw a line into tight condition and secure it in such condition.

Another object of the invention is to provide a wire line tightener having novel means for assembly on or about the line to be tightened and having novel means for securing the assembled parts together after the tightening process has been completed.

A still further object of the invention is to provide a novel two-part wire line tightener having novel means for actuating it, which means operates to prevent the separation of the parts until the desired degree of line tension has been obtained and certain securing elements have been applied for holding the parts permanently together.

Still another object of the invention is to provide means for coupling a guy wire with a ground anchor and for drawing and securing the guy wire tight between the ground anchor and the body to which it is attached.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 is a view partly in elevation and partly in section, of one form of the device embodying the present invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a view in elevation of one spool of the device.

Figure 4 is a view of the spool shown in Figure 3 but taken at right angles to such view.

Figure 5 is a view in section of a modified form of the device.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5 through the central portion of the same.

Figure 7 is a sectional view taken on the line 7—7 of Figure 8 of a further modification.

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Figure 9 is a view in elevation of a portion of the modified form shown in Figures 7 and 8.

Referring to the drawings wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 1 indicates generally one form of the device embodying the present invention. In this form of the invention, there are provided the two disk members 2 and 3, each of which has formed integrally therewith and upon one face the centrally located nut 4. In the opposite face of each of the disks from the nuts 4, there is formed the pair of circular recesses of countersunk openings 5, the edges of which merge, as is illustrated in Figure 2. Passing through each disk and through the nut 4 thereof from each of the recesses 5 is a passage or aperture 6 and secured in one of these apertures of each disk is one reduced end or trunnion 7 which forms an integral end extension of a flanged spool 8, the flange of the spool being positioned in the recess. A similar trunnion is formed at the opposite end of each spool and is freely insertible into and removable from the other aperture 6 of the opposed plate. Each of the plates, therefore, carries a spool and removably receives a trunnion of the spool of the other plate.

The flanges of the spools 8 are located in the recesses 5 of the plates so that the cut out central area of each spool coincides in width with the distance between the two plates when the same are in assembled relation and the area between the spools is of sufficient size to receive the line or cable which is to be tightened up by the device.

In order to facilitate the ready assembling of the plates and spools, a portion of the flange of each spool is cut away, as indicated at 9, so that after assembly, the cable will be snugly held between the spools. These cut out portions 9 of the spools are each in opposed relation to the flange of the other spool as will be readily seen upon an inspection of Figure 1.

Each of the plates 2 and 3 is provided with a series of apertures 10 about and adjacent its edge, for the reception of bolts 11 after the device has been manipulated in the manner hereinafter described to effect the tightening of a wire line.

The operation of the device is effected by means of the two-jawed wrench which is in-

dicated generally by the numeral 12 and which comprises the handle portion 13 and the bifurcated ends 14, each of which terminates in the open jaw 15. The space between the furcations 14 of the wrench is sufficient to snugly receive the two disks 2 and 3 when the latter have been assembled, so that each of the jaws 15 may engage with the nut 4.

In the operation of the tightener, the same is assembled on the wire such as that indicated by the numeral 16 by bringing the disks 2 and 3 together from opposite sides of the wire so as to insert the free end of each spool 8 into an aperture of the opposite disk and thus locate the wire in the space between the spools. The wrench is then applied in the manner described and manipulated to rotate the disks so that the wire line or cable will be wound up about the two spools. After the desired degree of tightness has been attained, the bolts 11 are inserted in the appropriate apertures 10 to connect between the disks at the peripheries thereof and to extend across opposite sides of the line. These bolts prevent the separation of the disks and also, because of the fact that the wire line extends across them, prevents the line from becoming unwound from the spools.

It will be observed that in the process of winding up the line, the furcations 14 of the wrench prevent the separation of the disks 2 and 3, and this duty is passed onto the bolts 11 after the wrench has been removed.

In Figures 5 and 6, there is illustrated a modified form of the tightener just described in which the parts are integral. In this form, it is necessary that the wire, which is to be tightened, be threaded through the tightener before it is connected between the bodies which it is to join together. In this form of the invention, the disks 17 are joined by the two spaced bodies 18, the area 19 between which is formed in cross section to snugly receive a cable and the outer surfaces of these bodies are transversely rounded, as indicated at 20, so as to form together a circular bearing surface on which the wire line or cable may be wound up.

The outer faces of the disk 17 have the nuts 21 integral therewith for the reception of the jaws of the wrench 12 and the disks adjacent their peripheries are provided with the plurality of openings 22 for the reception of connecting or coupling bolts such as those illustrated in connection with form 1, to hold the line after it has been wound up.

In Figures 7, 8 and 9, there is illustrated the form of the invention designed for tightly connecting a guy wire with a ground anchor. In this form, the wind up device is indicated generally by the numeral 23, and comprises a solid hub 24 about which are formed the disks 25.

These disks 25 are provided with the peripheral series of apertures 26 and the hub is provided with a central transverse aperture 27 in which the end of the guy wire is inserted and where it is securely held by the binding screw 28 which is tapped into the opening formed from one end and axially of the hub.

The hub 24 is circular in cross section and has its ends received in the rings 29 of a pair of links 30. These links are connected at their outer ends by a bolt 31, which also passes through the apertured end or yoke portion 32 of the ground anchor 33. This yoke end 32 of the ground anchor is disposed between the links 30, as illustrated. Intermediate its ends, the links 30 are provided with the short longitudinally extending slots 34 which are positioned to aline with the apertures 26 of the disks 25 so as to receive the securing or locking bolt 35 when the desired degree of guy wire tension has been attained.

The wrench member designed for rotating the take-up device 23 is indicated as a whole by the numeral 36, and comprises a handle 37 and the bifurcated end 38, the portions of which are bent or arcuately formed to coincide with the curve of the hub 24. The bifurcated end of the wrench 36 straddles the disks 25 so that the curved portions thereof will rest against the rounded surface of the hub, and a bolt 39 is then passed through apertures in the furcations and through the apertures 26 of the disks so that the rotation of the disks may be then effected by pulling upon the wrench handle 37. After the proper degree of tension is attained, the bolt 35 is extended through the apertures 34 of the links and the apertures 25 of the disks which are in proper position, so as to lock the links and the disks together and prevent unwinding of the cable.

It will be apparent that in the tightening of the cable, which is here indicated by the numeral 40, the hub 24 of the tightener will turn in the rings 29 of the links.

From the foregoing, it will be readily apparent that devices as herein described are of a relatively simple character and may, therefore, be inexpensively manufactured and at the same time, they are so designed as to withstand the heaviest strains which might be imposed upon devices designed for the purpose described.

I claim:—

1. A wire tightener comprising a pair of disk bodies, a means connecting between and coupling the disk bodies serving to facilitate the engagement of the tightener with a line, the said line being wrapped around the said disk connecting means, bodies carried by the disks and extending outwardly from the remote faces thereof for engagement by a wrench, and means for preventing the tightener unwinding on a wire which has been tightened thereby.

2. A line tightener comprising a pair of disks each having a series of apertures adjacent its periphery, a nut formed integral with each disk upon one face and at the center thereof, a pair of spools each secured at one end to the face of a disk opposite the nut, means for coupling the other end of each spool with the other disk whereby the disks are held in spaced relation by the spools, the spools being spaced apart to permit the passage of a line therebetween, and wrench means engageable with said nuts for rotating the disks, the apertures at the peripheries of the disks being designed to receive a transverse member for securing a tightened line against slackening.

3. A line tightener comprising a pair of disks each having a series of apertures adjacent its periphery, a nut formed integral with each disk upon one face and at the center thereof, a pair of spools each secured at one end to the face of a disk opposite the nut, means for coupling the other end of each spool with the other disk whereby the disks are held in spaced relation by the spools, the spools being spaced apart to permit the passage of a line therebetween, and wrench means engageable with said nuts for rotating the disks, the apertures at the peripheries of the disks being designed to receive a transverse member for securing a tightened line against slackening, said nut engaging means in addition to serving as a means for rotating the disks, operating to

prevent the separation of the disks during the turning operation of the same.

4. A line tightener comprising a pair of disk members each provided with a series of apertures adjacent its periphery, a nut formed integral with each disk upon one face and at the center thereof, a pair of spools each being secured at one end to the face of a disk opposite the nut, an extension constituting a trunnion upon the end of each spool opposite the end secured to a disk, each of said disks having an aperture for the reception of the trunnion of the spool of the other disk, said spools being spaced to have a line passed therebetween, wrench means adapted to simultaneously engage the nuts of the disks to effect the rotation of the disks and retain the same against separatory movement, and means for coupling the disks together at their peripheries through the first mentioned apertures.

5. A line tightener comprising a pair of disk members each provided with a series of apertures adjacent its periphery, a nut formed integral with each disk upon one face and at the center thereof, a pair of spools each being secured at one end to the face of a disk opposite the nut, an extension constituting a trunnion upon the end of each spool opposite the end secured to a disk, each of said disks having an aperture for the reception of the trunnion of the spool of the other disk, said spools being spaced to have a line passed therebetween, wrench means adapted to simultaneously engage the nuts of the disks to effect the rotation of the disks and retain the same against separatory movement, and means for coupling the disks together at their peripheries through the first mentioned apertures, each of said spools being provided with end flanges and each having a portion of one end flange cut away, the cut away portion of each spool flange being opposed to the complete flange of the opposite spool.

6. A line tightener comprising a hub body having a transverse passage for the reception of a line, means adapted to engage a line in the passage to secure the same, a pair of flat bodies surrounding said hub and in spaced relation thereon between which the line is wound, means for coupling said bodies together adjacent their outer edges, means for coupling the outer ends of said hub with a fixed element, and means for effecting the rotation of the hub and the bodies carried thereby independently of the means for coupling the hub with the fixed element.

7. A line tightener comprising a hub-like body having a transverse central aperture in which a line may be positioned, means carried by the hub for securing a line in said aperture, a pair of disk members arranged in spaced relation with said hub passing therethrough, said disk members having apertures adjacent their peripheries, a pair of links each having an aperture at one end in which an end of said hub positions, the disks being between the links, an anchor member secured between the other ends of said links, said links midway of their ends having openings designed for coaction with the peripheral apertures of the disks, a bolt adapted for extension through the openings of the links and through alined apertures of the disks, wrench means adapted to straddle said disks for engagement with the hub, and means for coupling the wrench means with the disks.

8. In combination in a line tightener, a pair of plates, an element carried by each plate and slidably extended into an aperture in the other plate, said elements maintaining the plates in side by side relation, the said elements being spaced to permit a line which is to be tightened to be disposed between and across the same, a bifurcated lever adapted to receive the plates between the furcations to prevent the separation of the plates, and means for connecting the furcations with the plates to effect the rotation thereof by the lever.

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