April 13, 1943. L. L. THOMPSON 2,316,727

WIRE LINE GUIDE

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Fig. 1

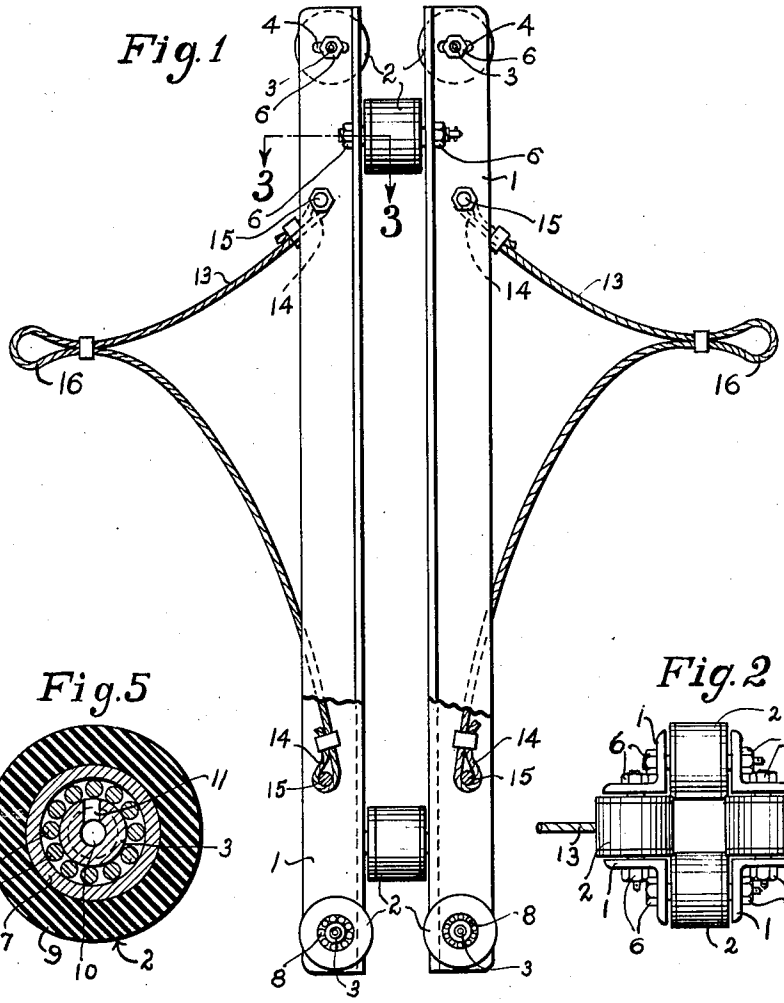


Fig. 5

Fig. 2

Fig. 4

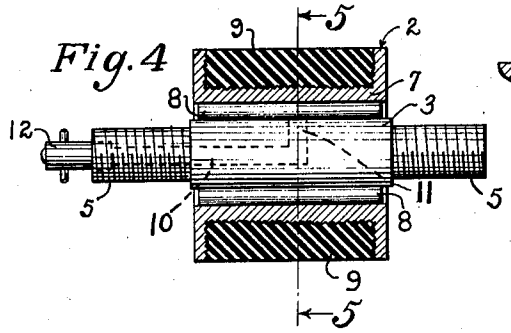
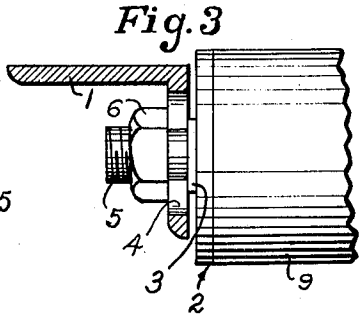


Fig. 3



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Fig.6

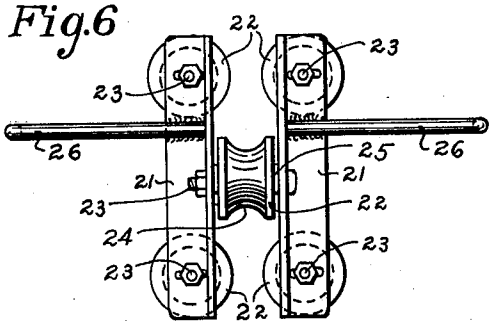


Fig.7

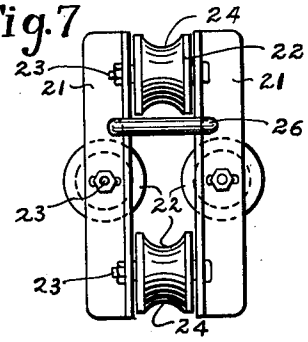


Fig.8

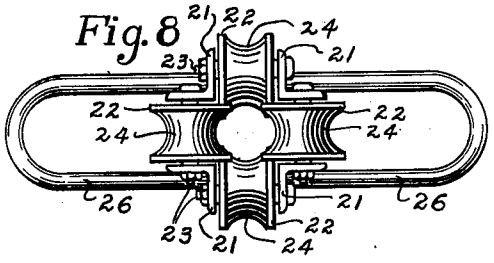


Fig.9

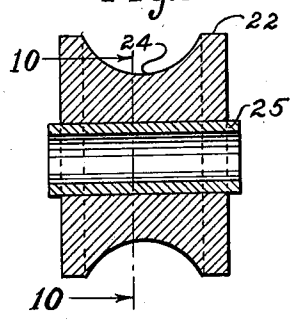


Fig.11

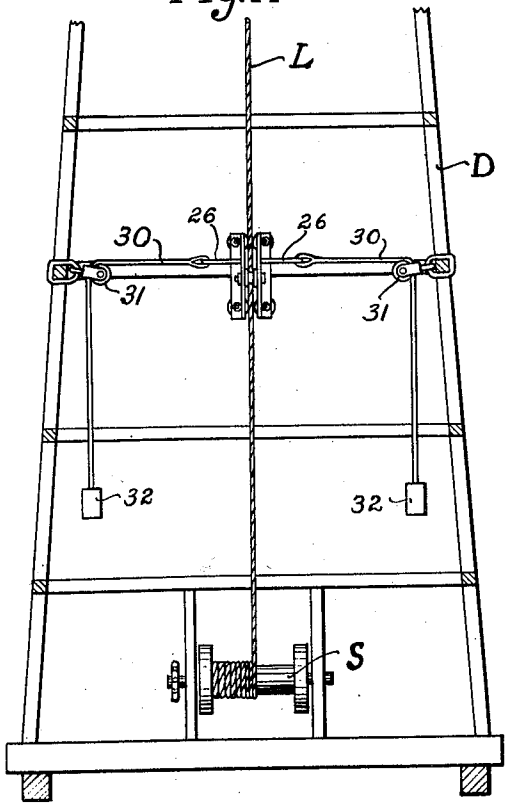
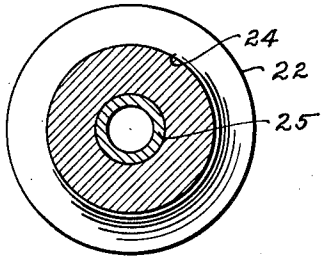


Fig.10



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WIRE LINE GUIDE

Lonnie L. Thompson, Iowa Park, Tex.

Application July 29, 1940, Serial No. 348,311

3 Claims. (Cl. 308—6)

This invention relates to an improvement in wire line guides for use in connection with hoisting equipment, such as drilling rigs and the like, for guiding the line to the reel or drum on which it is wound, or into the well or other point of extension of the line.

In the use of wire lines or cables that are employed in drilling operations, these are usually constructed of wire rope, and are operated rectilinearly to or from a reel or drum, and extend a considerable distance vertically through the derrick. Movement of the line in the reeling or unreeling operation frequently causes lateral vibration thereof, often referred to as "whip," which seriously wears and often breaks the line, and frequently causes improper feeding thereof to or from the drum.

Various attempts have been made to provide wire line guides to eliminate these objections, but these have been of expensive construction or have been ineffective in use, causing undue friction and wear on the line which required its replacement prematurely.

The object of this invention is to improve the construction of wire line guides by providing a minimum of friction and wear on the line, effective guiding of the cable or line to or from the reeling device, and such simplicity of structure that the guide is inexpensive to make, economical to use and may be easily and readily repaired.

In carrying out this object, I have shown in the accompanying drawings a preferred embodiment of the invention together with a modification thereof, in which:

Fig. 1 is a side elevation of the preferred form of the invention with parts broken away and in section to illustrate its construction;

Fig. 2 is a top plan view thereof;

Fig. 3 is a detail sectional view through one of the frame angle bars showing an end of the roller mounted therein, on the line 3—3 of Fig. 1;

Fig. 4 is a longitudinal sectional view through a guide roller removed showing its bearing support in elevation;

Fig. 5 is a transverse sectional view therethrough on the line 5—5 of Fig. 4;

Fig. 6 is a side elevation of a modified form of guide;

Fig. 7 is a similar view at right angles thereto;

Fig. 8 is a top plan view thereof;

Fig. 9 is a longitudinal section through a modified form of guide roll removed;

Fig. 10 is a transverse sectional view therethrough on the line 10—10 of Fig. 9; and

Fig. 11 is a vertical sectional view through a portion of a derrick showing the wire line guide in use.

Referring to the form of the invention shown in Figs. 1 to 5, the guide is constructed of a frame shown as formed of four upright angle bars 1, arranged with the sides thereof substantially parallel and the apexes facing the center of the frame as shown in Fig. 2. The angle bars 1 are spaced apart and have guide rollers 2 therebetween journaled on shafts 3 that extend transversely between the parallel sides of each pair of angle bars 1. The opposite ends of each shaft 3 extend through slots 4 which extend transversely of each angle bar for adjustment of the roller on said shaft toward and from the center of the frame. The opposite ends of each shaft 3 have reduced screw-threaded portions 5 with an enlarged portion therebetween of greater length than the roller 2 to form a spacer between the spaced angle bars 1 and being secured thereto by nuts 6 screw-threaded onto the reduced ends 5 of the shaft.

The construction of each roller 2 is shown in detail in Figs. 4 and 5. A flanged sleeve 7 is journaled on roller bearings 8 on the spacer portion of the shaft 3, and receives in the periphery thereof a relatively thick band of substantially soft rubber or rubber-like material, shown at 9. A synthetic rubber composition is preferably employed as it is resistant to deterioration when exposed to oil. The periphery of the sleeve 7 and the inner sides of the flanges thereof are roughened, knurled or otherwise provided with projections that will become embedded in the surface of the resilient material to cause adherence thereof to the sleeve.

Provision is made for lubricating the roller bearings 8 through a passageway 10 with a lateral passage 11 to the periphery of the shaft 3. The outer end of the shaft 3 has a lubricant fitting 12 secured thereto at the end of the passageway 10 for introducing lubricant thereto.

At opposite sides of the frame is a pair of cables 13, by which it is adapted to be suspended, which cables 13 have loops 14 at opposite ends thereof through which bolts 15 extend in passing between the angle bars 1 of the spaced pairs, and by which the frame is adapted to be supported. Intermediate the ends of each cable 13 is formed a loop 16 therein arranged preferably adjacent the upper end of the cable or above the longitudinal center of weight of the guide so that the guide will always remain in an upright position when suspended between the pair of cables 13.

In this form of the invention, the guide is shown as provided with eight rollers located in groups of four at each opposite end of the frame, and at right angles to each other so placed as to provide a passageway axially of the frame to receive the wire line or cable slidably therethrough. These sets of rollers are spaced an appreciable distance apart, being approximately thirty inches in practical use, so that the wire line is guided in a linear path over an appreciable distance, which has a tendency to stabilize the entire length of the line and to prevent whip action thereof.

In the modified form shown in Figs. 6 to 10, only six rollers are employed, located in groups of two at opposite ends of the guide and two intermediate rollers therebetween. In this form, the frame is constructed substantially as above described, of angle bars **21**, having rollers **22** mounted on shafts **23** adjustably connected with the angle bars **21**. As shown in Figs. 9 and 10, each roller here illustrated may be of metal construction provided with a circumferential groove **24** therein for guiding the wire line or cable, and is journaled on a bushing **25** which surrounds the shaft **23** and serves as a spacer between the pairs of angle bars **21** being clamped thereto by the bolt construction of the shaft **23**. However, it will be evident, that the character of rollers shown in Figs. 1 to 5 may be used in this form of the invention in place of the rollers **22**, or the latter may replace the rollers shown in the first-described form of the invention.

In place of the cables shown in Fig. 1 for suspending the guide, this modified form of the invention is shown as provided with loops **26** on opposite sides thereof. Each loop **26** is preferably constructed of a metal rod bent into U-shape and embracing a pair of angle bars **21** to which the ends of the loop **26** are welded or otherwise secured.

Fig. 11 illustrates a portion of a derrick, designated generally D, having a spool S mounted adjacent the bottom thereof from which a wire line L extends upwardly within the derrick. The modified form of guide wire line is illustrated for guiding the line L to or from the spool S, the guide being suspended within the derrick D by a pair of straps **30**, of cable or other material, one end of each of which is secured to a loop **26** and extends therefrom over a guide sheave **31** attached to a side of the derrick D, thence downwardly with a weight **32** secured to the lower end of the strap. These weights **32** are sufficient to suspend the wire line guide in proper position while yet allowing some bodily movement thereof transversely of the derrick to accommodate for transverse movement of the wire line, although serving to effectively guide the latter as it is wound on the spool S.

In practical use, the wire line guide is suspended vertically about twenty-five feet above the spool or drum, and the weights are sufficient to prevent whip action or undue vibration in the line as the latter is spooled to or from the drum. As the wire line is coiled from side to side of the drum, the weighted straps will permit the guide to shift somewhat along a horizontal path parallel with the drum, and at the same time to maintain sufficient tautness to prevent the line from whipping or vibrating from side to side.

The form of the invention shown in Figs. 1 to 5 is used in a manner similar to that illustrated in Fig. 11, the cables **13** preferably being suspended by a pair of weighted straps at opposite sides of the derrick, as shown at **30—31**.

Although the construction shown in Figs. 1 to 5, having eight guide rollers is preferable for guiding cables of great length, the form shown in Figs. 6 to 10 is somewhat less expensive and of smaller size and weight, but entirely satisfactory for light work and relative short lengths of cable or line.

I claim:

1. A wire line guide comprising a frame constructed of a plurality of elongated angle bars having sides thereof arranged in parallel spaced relation, shafts extending between said sides of the angle bars at longitudinally spaced portions of the guide, rollers journaled on said shafts and adapted to receive and guide a wire line therebetween, said angle bars having transverse slots therein receiving the ends of the shafts for bodily adjustment of the rollers transversely relative to the angle bars, each of said shafts having spacing means connected therewith holding the angle bars in rigid spaced relation from each other, and means for adjustably securing each end of each shaft to the adjacent angle bar.

2. A wire line guide comprising a plurality of elongated angle bars having sides of adjacent bars spaced from each other and arranged in parallel relation, shafts extending between the sides of adjacent bars at each opposite end thereof and arranged at each end on opposite sides of the center of said guide and at right angles to each other, each of said shafts having spacing means connected therewith holding the angle bars in rigid spaced relation, means for securing each end of each shaft to the adjacent angle bar, and rollers mounted on said shafts, said rollers being arranged to define a polygonal opening therebetween at each opposite end of the guide and the rollers at one end being spaced remotely from the rollers at the opposite end of said guide.

3. A wire line guide comprising a plurality of elongated angle bars having sides of adjacent bars spaced from each other and arranged in parallel relation, shafts extending between the sides of adjacent bars at each opposite end thereof and arranged at each end on opposite sides of the center of said guide and at right angles to each other, each of said shafts having spacing means connected therewith holding the angle bars in rigid spaced relation, means for securing each end of each shaft to the adjacent angle bar, and rollers mounted on said shafts, said rollers being arranged to define a polygonal opening therebetween at each opposite end of the guide and the rollers at one end being spaced remotely from the rollers at the opposite end of said guide, and flexible loops connected with the angle bars at opposite sides of the guide adapted to receive suspending means for the guide.

LONNIE L. THOMPSON.