Dec. 25, 1956 J. E. DE ARMENT 2,775,357

CABLE REEL DOLLY AND LIFTING APPARATUS

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FIG. 1.

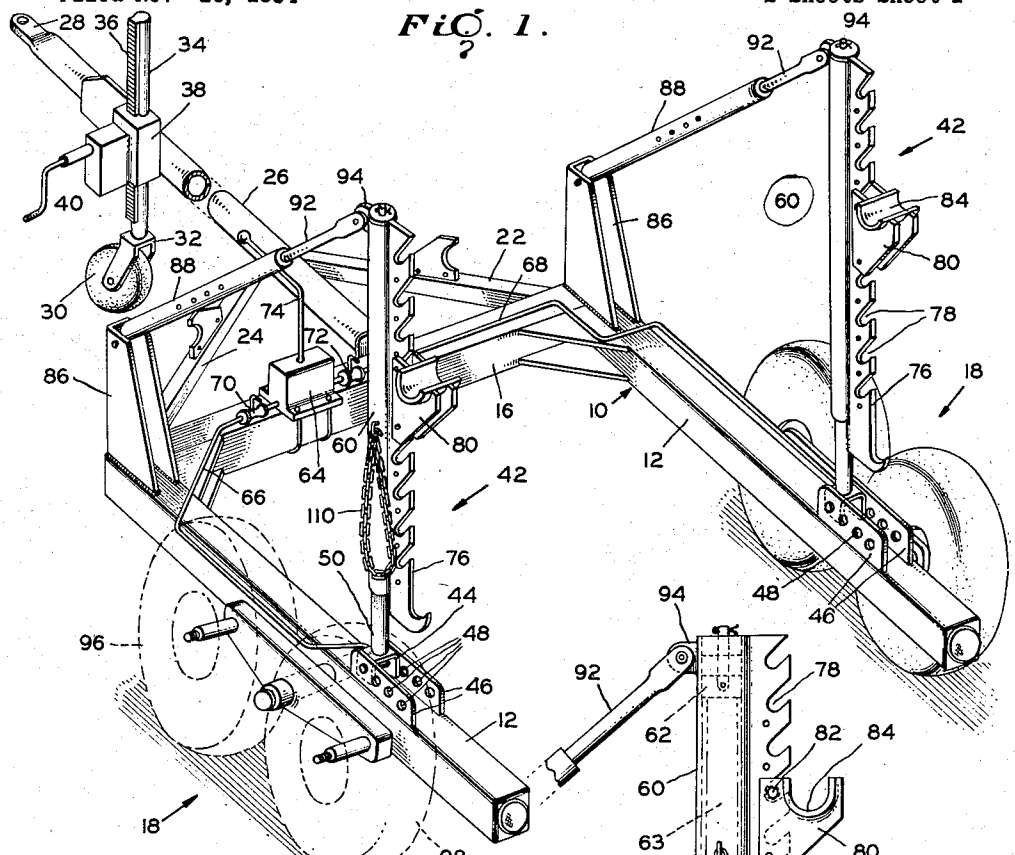

FIG. 4.

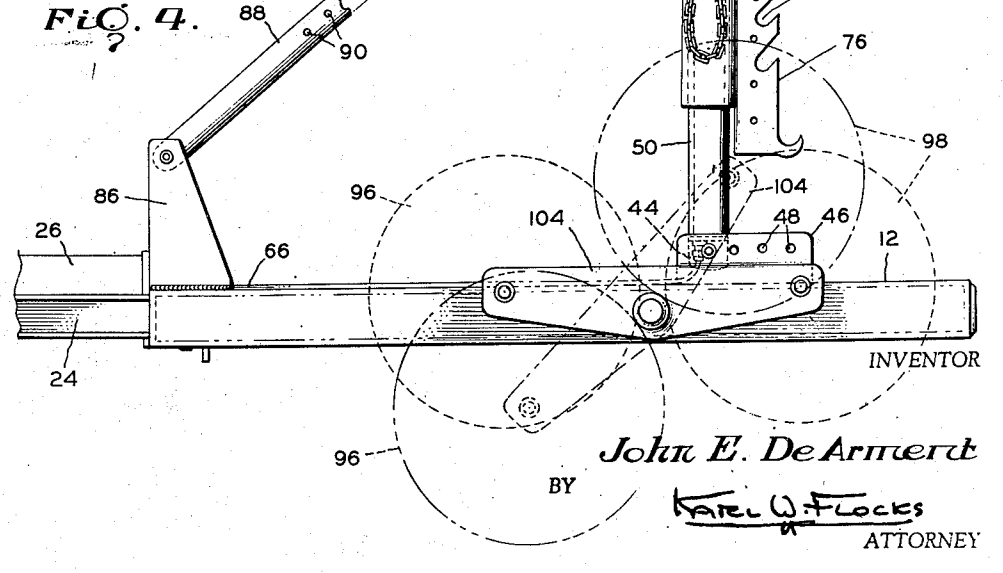

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FIG. 2.

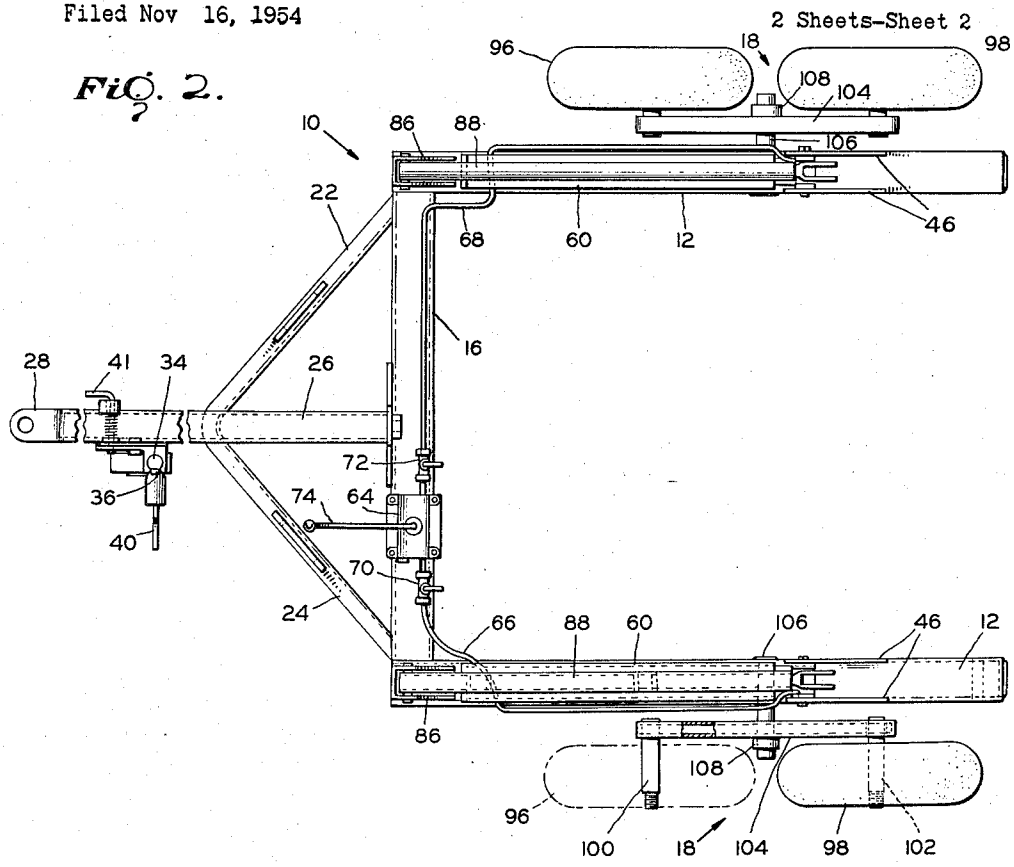
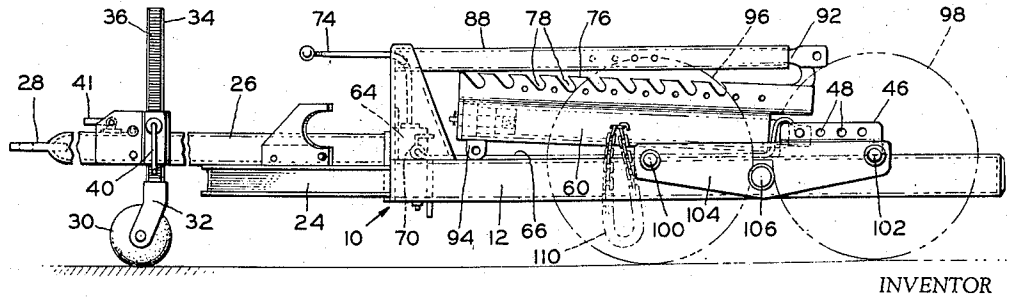


FIG. 3.



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CABLE REEL DOLLY AND LIFTING APPARATUS

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Application November 16, 1954, Serial No. 469,150

3 Claims. (Cl. 214—390)

The present invention relates to apparatus for lifting and supporting large loads thereon. More particularly, the present invention relates to a wheeled truck or dolly that is adapted to support a cable reel thereon, whereby the cable reel may be transported during the unwinding of the cable therefrom.

In the installation of cable for telephone lines and other electrical equipment, it is frequently desirable to place the cable within a ground conduit, which operation necessarily provides for the continuous movement of the cable reel. Cable reels are quite large and bulky and difficult to manually move around. Moreover, if the terrain in which the cable is to be placed is uneven, rolling of the cable reel over the rough terrain becomes a difficult undertaking.

Prior to the instant invention, the usual apparatus for transporting a cable reel consisted of a conventional truck or other vehicle upon the rear of which was mounted a suitable cable reel support. Such devices were impractical in use since there was no provision for lifting the heavy reel in position for the unwinding operation. Cable reel lifting apparatus was developed but soon proved to be unsatisfactory in use, since the means for lifting the cable reel was undependable in operation and incapable of maneuvering over rough terrain.

It is therefore an object of the present invention to provide a portable dolly for use with a cable reel for lifting and supporting the cable reel and for aiding in the cable laying operation thereof.

Another object of the present invention is to provide a portable dolly for lifting and supporting a cable reel, the lifting and supporting apparatus being capable of vertically adjusting the cable reel thereon.

Still another object of the present invention is to provide hydraulically operated lifting apparatus for a cable dolly, the hydraulic lifting apparatus vertically adjusting the means for supporting a cable reel.

Still another object of the present invention is to provide a cable dolly including a novel linkage system for bracing cable reel supporting apparatus, the linkage system and supporting apparatus being adapted to be moved to a lowered inoperative position when the dolly is transported in an unloaded condition.

Still another object of the present invention is to provide a cable dolly that includes a tandem wheel arrangement whereby the dolly may be transported over rough terrain with little shock.

Still another object of the present invention is to provide a dolly for supporting a cable reel thereon, tandem wheels being pivotally mounted on the dolly, the tandem wheels being adapted to be moved to a position for vertically lifting the cable reel supporting apparatus.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a perspective view of the cable dolly embodied

in the present invention illustrating the cable reel supporting apparatus in the upper or operative position;

Fig. 2 is a top plan view of the dolly whereby the supporting elements for the cable reel are located in a lower or inoperative position;

Fig. 3 is a side elevational view of the dolly as shown in Fig. 2; and

Fig. 4 is an enlarged side elevational view of a portion of the dolly showing the adjusting position of the tandem wheels for moving the cable reel supporting elements into the raised or operative position.

Referring now to the drawings, and particularly to Fig. 1, the cable dolly embodied in the present invention is illustrated and comprises a wheeled truck that is adapted to receive a cable reel thereon, the cable reel being normally of the large drum type provided with a central shaft. Although the cable dolly embodied herein is designed particularly for lifting and transporting cable reels, it is seen that the operation of the dolly is not restricted to use with cable reels, but may be advantageously employed in operations where it is required to lift a large load. As shown in Fig. 1, the dolly is positioned in the upright or operating position and includes a U-shaped frame generally indicated at **10**. The frame **10** comprises a pair of spaced parallel side members **12** which are joined to an end member **16**. As will be described hereinafter, the open side of the U-shaped frame **10** is adapted to accommodate a cable reel and defines the rear of the cable dolly. Supporting the frame **10** and mounted on each of the parallel side members **12** is a tandem wheel assembly generally indicated at **18**. The tandem wheel assemblies **18** are adapted to provide for smooth movement of the cable dolly over uneven road and rough terrain and will be described in detail hereinafter. Secured to the end member **16** of the U-shaped frame **10** are angularly disposed front bars **22** and **24** which support an elongated hitch arm **26** that is also secured to the front end member **16**. The hitch arm **26** extends outwardly beyond the front bars **22** and **24** and terminates in a tongue **28** that is adapted to be secured to a coupling attached to the rear of a power operated vehicle. Adjustably supporting the hitch arm **26** adjacent the outer end thereof is a vertically adjustable wheel rest **30**. The wheel rest **30** is mounted between a forked member **32** that is joined to a vertical bar **34**. The vertical bar **34** is formed along one side thereof with teeth that define a rack **36**, the rack **36** extending through a gear box **38**. The gear box **38** includes a gear mechanism (not shown) that is adapted to engage the rack **36**. A suitable control handle **40**, which operatively engages the gear mechanism within the gear box **38**, extends outwardly therefrom and may be manually rotated to vertically adjust the bar **34**, thereby raising or lowering the hitch arm **26**. As shown in Figs. 2 and 3, a pin **41** extends into the gear box **38** and is adapted to positively lock the rack **36** in the desired position.

In order to adjustably mount a cable reel in the dolly between the spaced parallel side members **12** of the frame **10**, supporting members generally indicated at **42** are provided. Each of the supporting members **42** includes a foot member **44** that is positioned between plates **46**, the plates **46** being secured to the upper surface of a side frame member **12** and defining a channel therebetween. The plates **46** are formed with adjustment openings **48** which provide for the angular adjustment of the supporting members **42** with respect to the frame **10**. The openings **48** in the plates **46** are adapted to communicate with an opening formed in the foot members **44** in the channels defined by the plates **46**. It is seen then that the supporting members **42** may be pivotally moved on the frame **10** from the upright or operating position shown

in Figs. 1 and 4 to the collapsed or inoperative position shown in Figs. 2 and 3.

Formed as part of each of the supporting members 42 and extending upwardly from a foot member 44 is a tubular housing 50 that defines the housing for a hydraulic ram, the hydraulic ram supplying the necessary power for lifting a cable reel or heavy load. As shown in Fig. 4, a cylinder 60 envelopes the housing 50 and is mounted for sliding movement thereon. Positioned within the cylinder 60 and secured thereto at the upper end thereof is a piston 62 which is joined to a hollow inner cylinder 63, the piston 62 being responsive to hydraulic fluid to vertically move within the housing 50. It is seen that vertical movement of the piston 62 results in a corresponding movement of the cylinder 60. In order to effect the vertical movement of the cylinder 60 on the tubular housing 50, a hydraulic system is provided and includes a pump 64 manually operated by a handle 74, the pump being mounted on the end member 16 of the U-shaped frame 10. Hose lines 66 and 68 for supplying the hydraulic fluid to the inner cylinder 63 extend outwardly from the pump 64 and are directed along the side members 12 to the foot members 44 where access is had to the inner piston 62. Cut off valves 70 and 72 are located in the lines 66 and 68, respectively, adjacent the pump 64 to selectively provide fluid to either or both of the hydraulic rams, as desired. Thus, if the dolly is positioned on an incline, one of the cylinders 60 can be raised to a sufficient height to locate the axis of a cable reel carried by the dolly in a substantially horizontal position.

It is apparent that upon movement of the manually operated handle 74, the hydraulic pump 64 will be operated to force hydraulic fluid through the fluid lines 66 and 68 into the inner cylinder 63 of the hydraulic ram. The piston 62 is then forced upwardly, which movement causes the cylinder 60 to move in a vertical direction.

In order to provide for the reception of various sizes of cable reels in the dolly, the supporting members 42 further include a hanger structure 76 that is integrally joined to the cylinder 60 and movable therewith. As shown in Figs. 1 and 4, the hanger structure 76 is formed with slots 78 along the length thereof, the slots defining positions for receiving various size diameter cable reels. In order to receive the cable reel on the dolly, the supporting members 42 are provided with cradle members 80 which are defined by a pair of parallel plates. The plates of the cradle members 80 are joined together by a pin 82 and are formed with U-shaped impressions on the upper end thereof, the U-shaped impressions receiving a U-shaped bearing member 84. Normally, a cable reel is provided with a central shaft that projects outwardly rfom both sides of the reel. Thus, when mounting the cable reel in the dolly, the shaft thereof is received by the bearing members 84 and the cable reel is thereby supported for rotation between the supporting members 42. As discussed above, the cradle members 80 may be positioned in any one of the adjustment slots 78 of the hanger 76, as desired. However, the position of the cradle members 80 in the slots 78 will generally be determined by the size of the cable reel to be used. As shown in Fig. 4, the pin 82 which extends through the plates of the cradle members 80 rests in an adjustment slot 78 and thereby secures the cradle members 80, which carry the cable reel, in the desired position in the hanger structure 76. It is also understood that during the cable lifting operation, it may be desirable to manually adjust the cradles 80 on the hangers 76 so that the cable reel shaft fits within the bearing members 84. The cable reel may then be lifted automatically by operation of the hydraulic rams.

In order to rigidly brace the supporting members 42, a collapsible bracing structure is provided and includes channel supports 86 mounted on the front end of the side frame members 12, the channel supports being defined by a pair of trapezoidally shaped plates integrally joined to an end plate. Pivotally secured in the channel supports 86 at the uppermost portion thereof are elongated sleeves 88 which are provided with appropriately spaced openings 90 (see Fig. 4). Telescopically sliding within the elongated sleeves 88 are adjustment bars 92, the adjustment bars also being provided with appropriately spaced openings (not shown), the last named openings being adapted to communicate with the openings 90. It is seen that the adjustment bars 92 may be secured in various positions within the sleeves 88 by inserting a pin in the appropriate opening 90 and in the corresponding opening in the adjustment bars 92. When the supporting members 42 are located in the upright or operative position, each of the adjustment bars 92 is secured at the outermost end thereof to an extension piece 94, the extension piece 94 being integrally joined to the uppermost end of the cylinders 60. It is seen that the supporting members 42 are firmly braced in position by the adjustment bars 92 and sleeves 88. However, if it is desired to pivot the supporting members 46 to a different angular position, it is only necessary to adjust the relative positions of the adjustment bars 92 with respect to the sleeves 88. It is apparent, of course, that the angular position of the supporting members 42 may be further adjusted by moving the foot members 44 within the channels defined by the plates 46 until any one of the four openings 48 align with the openings in the foot members 44.

As described hereinabove, the tandem wheel assemblies 18 are adapted to provide for smooth movement of the dolly over uneven roads or rough terrain. The tandem wheel assemblies 18 each includes a pair of wheels 96 and 98 which are provided with the conventional pneumatic tire. As shown in Fig. 2, the wheels 96, 98 are mounted on stub shafts 100 and 102, respectively, which are, in turn, journalled for rotation in walking beams 104. The walking beams 104 are secured at the midpoints thereof to shafts 106 which are journalled for pivotal movement in the side members 12 of the U-shaped frame 10. As shown in Fig. 2, the walking beams 104 are prevented from endwise movement on the shafts 106 by collars 108 that are secured to the shafts 106. It is seen that as the dolly is transported over a rough road or hilly terrain the whels 96 and 98 will follow the undulations in the road or terrain by pivoting with the walking beams 104, the resulting movement of the wheels enabling the frame of the cable dolly to remain in a substantially horizontal position and thereby enabling cable to be removed from a cable reel carried by the dolly in an efficient manner.

If it is desired to add additional height to the dolly, for example when an extremely large cable reel is mounted thereon, or for any other purpose, the walking beams 104 may be rotated in a counterclockwise direction as seen in Fig. 4 to move the wheels 96 in contact with the ground and thereby raise the dolly frame. It is understood that both walking beams 104 are moved in the same manner to locate the wheels 96 in the same position. In order to retain the wheels in the lifted position, a chain 110 is provided and is secured to the cylinder 60 at one end and to the lifted end of the walking beam 104 at the other end.

As shown in Fig. 1, the cable dolly described herein is illustrated in the raised or operative position. However, it is desirable on occasions to transport the dolly free of load and thus the supporting members 42 may be moved to a lowered or inoperative position. As shown in Figs. 2 and 3, in order to move the supporting members 42 to the inoperative position, it is only necessary to unpin the adjustment rods 92 from the extension 94. The supporting member structures 42 are then pivotally collapsed until the extension 94 contacts the side frame members 12 as shown in Fig. 3. The adjustment bar 92 is then unpinned from the elongated sleeve 88 and allowed

to slide therein, and the sleeves are then pivotally moved to a position over the supporting members.

It is seen that the cable dolly described herein may be simply and quickly operated by a single individual to lift a cable reel into the position for laying cable. The hanger structure **76** provides for the adjustment necessary to accommodate different size reels and in addition enables the cradles **80** to be adjusted to the height of the cable reel shaft. The plates **46** provide for angular adjustment of the supporting members and thereby promote safety when installing or removing the cable reels since the reels are more easily handled when inclined. The hydraulic rams are simple to operate and by use of the valves **70**, **72**, may selectively move the supporting members **42** to compensate for inclines in the terrain during the cable laying operation. The tandem wheel arrangement enables the dolly to be moved over rough terrain or uneven road at maximum speed during the cable laying operation, the wheels straddling the trench in which the cable is placed.

Although not shown, it is understood that power operated rewind or unwind mechanism may be employed and can be conveniently mounted on the frame **10**. It is also understood that the lifting apparatus described herein may be utilized for purposes other than lifting cable reels. For example, large manhole covers or very heavy motors and the like may be conveniently lifted and transported by the dolly.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. In a cable reel dolly, a frame, a pair of spaced hydraulic cylinders mounted for pivotal movement on said frame, bracing means secured to said frame for supporting said hydraulic cylinders in an upright position, said bracing means including a pair of spaced sleeves pivotally mounted on said frame, and a pair of arms each of which telescopically engage a sleeve and being pivotally secured at the upper end thereof to an adjacent cylinder, said arms being disengageable from the upper end of said cylinders when said cable reel dolly is to be transported unloaded, said cylinders being pivotally moved from the upright position to a substantially horizontal position, and said arms being telescoped within the associated sleeves, each of said sleeves being pivotally folded over the adjacent cylinder.

2. In a cable reel dolly as set forth in claim 1 wherein each of said cylinders includes a foot member that is adjustable in position on said frame to pivotally adjust the cylinders to an inclined position in accordance with the load to be carried therein.

3. In a cable reel dolly as set forth in claim 1 which includes tandem wheels mounted on said frame, and chain means secured to said cylinders and to either side of said tandem wheel structure for raising one of each set of said tandem wheels, thereby lowering the other wheel asssociated therewith, said raised wheels thereby vertically lifting said supporting means.

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