Dec. 14, 1943. R. T. HENDRICKSON 2,336,684

LEVEL WINDING DEVICE FOR WINCH DRUMS

Filed Oct. 8, 1942 2 Sheets-Sheet 1

Fig. 1.

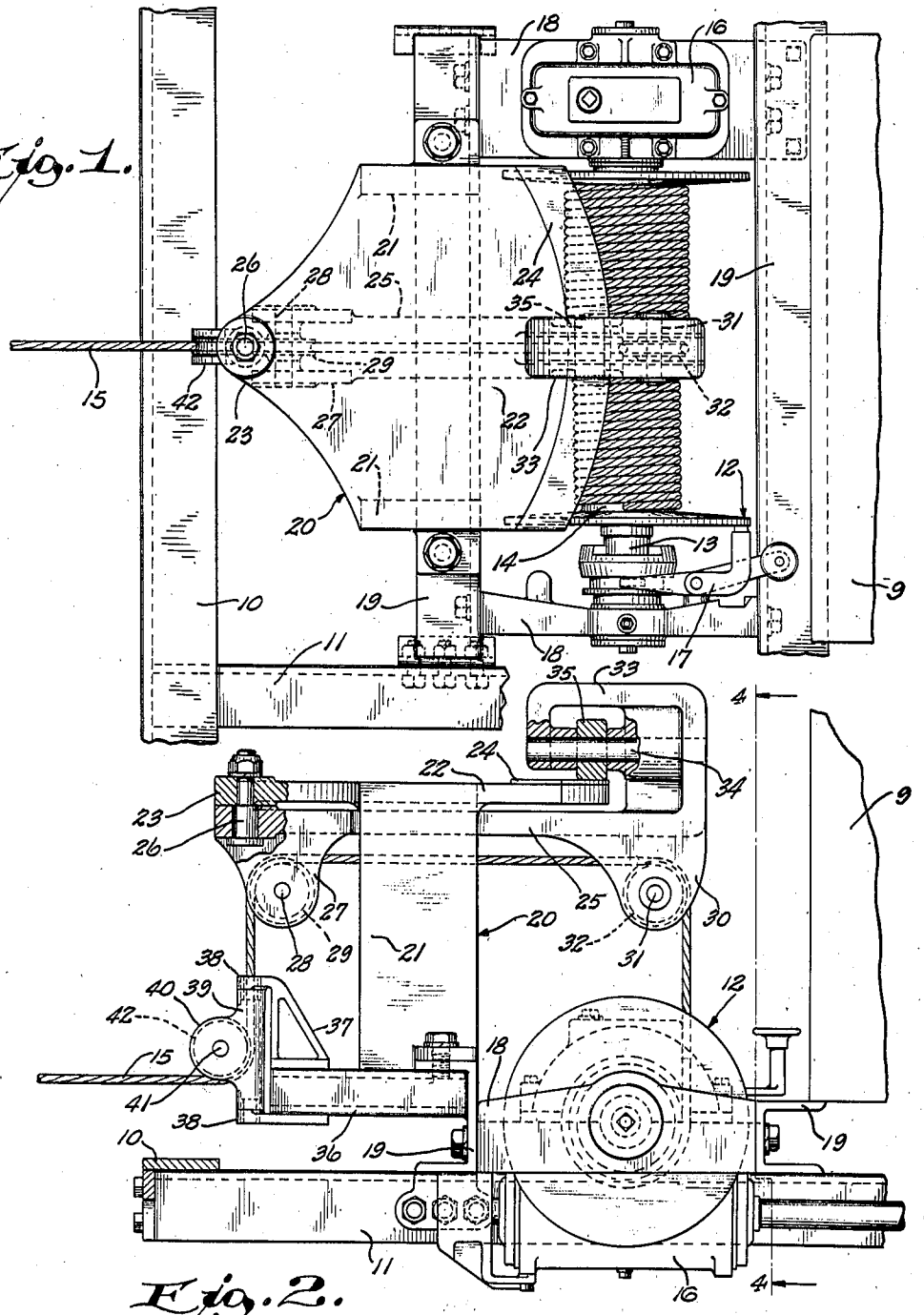


Fig. 2.

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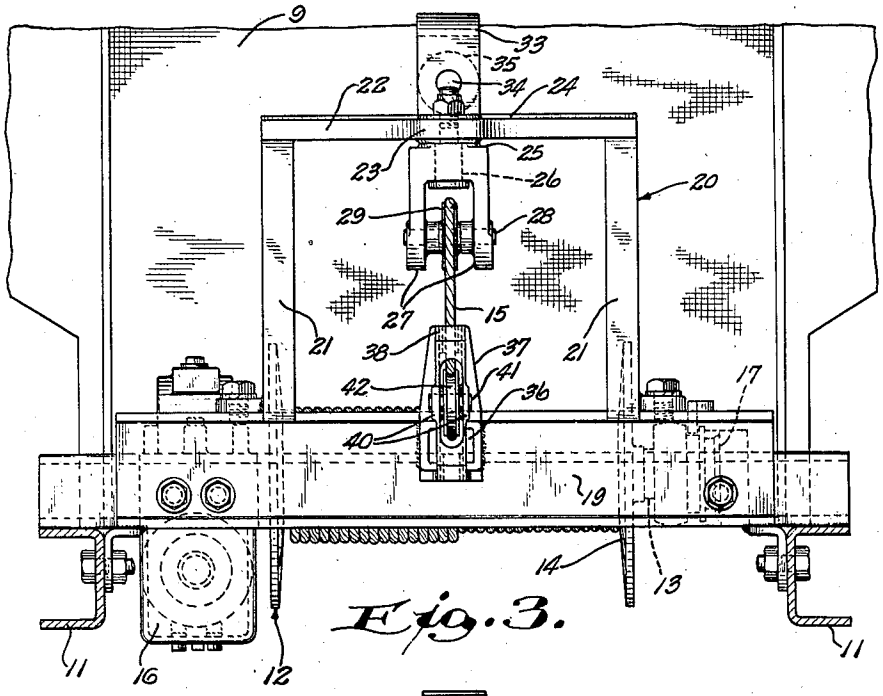


Fig. 3.

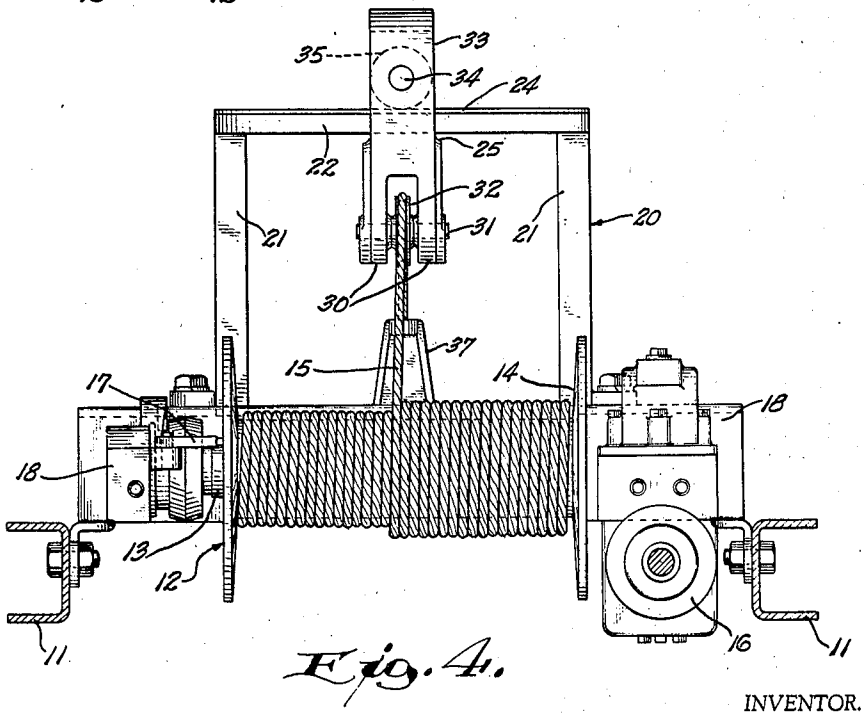


Fig. 4.

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LEVEL WINDING DEVICE FOR WINCH DRUMS

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Application October 8, 1942, Serial No. 461,279

2 Claims. (Cl. 242—157)

This invention relates to improvements in level winding devices for winch drums.

In the operation of a winch drum the cable will ordinarily tend to wind and pile up unevenly on the drum. This is objectionable because it will increase the wear and friction on the cable. Where power driven winches are mounted on motor trucks or vehicles additional problems are presented because of varying angles of extent of the portions of the cable being led to the winding drum of the winch. In many installations it is desirable and necessary to mount the winch and its associated mechanism on a motor truck frame between the front end of the radiator and the rear of the bumper bar. Winch level winding devices are generally well known, but it is a primary object of the present invention to provide a simple, effective and compact level winding device for direct association with a winch winding drum, and of a nature to accommodate the led portion of the cable regardless of its angle of extent and arranged so that the winch and level winding device assembly may be conveniently mounted on a truck frame entirely within the space between the radiator and the front bumper bar.

A further object of the invention is to provide a winch drum level winding device equipped with a swivelingly mounted sheave which receives and directs that portion of the cable which is led to the level winding mechanism and drum.

A further object of the invention is to provide a level winding device for winch drums having a swingably mounted cable guiding sheave which is positioned immediately over and relatively close to the drum, permitting the cable to follow very freely to ensure level winding operations, and preventing the cable from piling up at the ends of the winding drum.

A further object of the invention is to provide a winch drum level winding device which is well suited for mounting adjacent a winch on a desired portion of a motor vehicle, which is strong and efficient in operation, which is of simple and inexpensive construction, and which is well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved level winding device for winch drums, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawings in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a top view of a winch and the improved level winding device shown mounted on a motor truck frame between the radiator and front bumper bar thereof;

Fig. 2 is a side view of the showing in Fig. 1, only with portions broken away and in section;

Fig. 3 is a front view of the winch and level winding device assembly mounted on a motor truck forwardly of the radiator, with portions of the truck frame in section; and

Fig. 4 is a rear view of the winch and level winding device assembly, with the truck frame on which it is mounted shown in section.

Referring now more particularly to the drawings it will be observed that the radiator of a motor truck is indicated by the numeral 9, and forwardly of the truck radiator is a transverse front bumper bar 10 carried by the forward end portions of spaced longitudinal chassis or frame members 11.

A winch, designed for mounting on the chassis or frame members 11 of the truck in the space between the radiator 9 and rear of the bumper bar 10, is indicated generally by the numeral 12. There is fast on the driven and controlled portion of the winch shaft 13, a winding drum 14. Portions of an elongated cable 15 are adapted to be wound in orderly and even convolutions on the drum. The drum is driven from the transmission of the motor truck (not shown) through a suitable power take-off unit 16. Brake and clutch mechanism 17 control the winding drum.

The end portions of the winch shaft 13 are journalled in suitable bearing members carried by end supporting bars 18. Respective ends of said bars are rigidly secured to spaced transverse angle iron members 19 which are seated on and extend between the motor truck front chassis members 11 and are suitably secured thereto by lugs, brackets, or other means. Thus, the winch unit is mounted in the space between the radiator 9 and the bumper bar 10, and is rigidly supported by the chassis members 11.

The winch supporting transverse front angle iron member 19 also forms a convenient mounting for a level winding device, indicated generally by the numeral 20. Said level winding device includes a pair of spaced vertical supports 21 rigidly secured at their lower ends to said front transverse angle iron member 19. The vertical supports 21 carry at their upper ends and are spanned by a flat horizontal deck 22. The deck, at its forward end, which is slightly rearwardly of the bumper bar 10, is centrally reduced, as at 23. The top rear face portion of the deck 22

is traversed by a curved plate 24, forming a track.

A swingable arm 25 has its major portion underlying the deck 22 and the forward end of said arm is pivotally connected to the reduced portion 23 of the deck 22 by a pivot stud 26. Said arm 25, below its pivotally connected front end portion, is formed with depending bifurcations 27 which serve to mount a transverse pin 28, the axis of the pin being horizontal. Revolubly mounted on the pin 28 between the bifurcations 27 is a guide sheave 29.

The undersurface of the rear end portion of the arm 25 is also formed with bifurcations 30 carrying a transverse pin 31 on which is revolubly mounted a rear guide sheave 32. The latter sheave is longitudinally alined with the front upper sheave 29.

The rear end portion of the swingable arm 25 is additionally formed with an integral upstanding gooseneck bracket 33 which overhangs the rear track-equipped top face portion of the deck 22. Portions of said gooseneck bracket support a horizontal shaft 34 which has revolubly mounted thereon a roller 35.

Medially of the vertical supports 21 there is a bar 36 extending horizontally forwardly from the angle iron member 19. A bracket 37 is rigidly mounted on the forward end of said bar 36. Between vertically spaced horizontal flanges 38 on said bracket member 37 the vertical bored barrel portion 39 of a swivel sheave assembly is swingingly mounted. Forwardly of the barrel portion 39 the sheave assembly includes spaced vertical ears 40 which mount a horizontal pin 41, the latter revolubly carrying a lower, forward sheave 42.

When the winch and level winding device assembly is mounted on a motor truck the cable 15 extends from forwardly of the motor truck. It then engages the under and rear side portions of the lower swingable sheave 42 and passes upwardly through the bore of the barrel 39 and out of an opening therefore in the top flange 38 of the bracket 37. It should be noted that the bore in the barrel portion 39 is arranged to communicate with the space between the ears 40. From the barrel portion 39 the cable extends upwardly and over the front upper sheave 29 and then rearwardly, horizontally to engage top and rear portions of the rear sheave 32. From the latter the cable extends down to the winch drum 14 relative to which it is adapted to be wound and unwound.

The winch and level winding device are particularly designed for use on motor trucks of the type which may be employed by the Army. It is highly desirable that all of the winch and level winding mechanism be disposed rearwardly of the front bumper 10 of the truck because the bumper is frequently employed for pushing operations and anything projecting forwardly of the bumper would interfere with such practices. As installed on a truck, the winch and cable are employed for all customary purposes. For instance, to extricate a truck from a stuck or mired position, the cable 15 may be unreeled from the drum, extended considerably forwardly of the truck, and anchored to some fixed object. Thereafter if the winch is operated to wind up the cable this will effectively pull the truck out of its mired position.

The improved level winding device insures proper and even winding of the cable relative to the winch drum 14. The lower forward guide sheave 42 is swingable about its vertical axis so as to position at any angle to aline with the object to which the extended end of the cable 15 is secured. Also, the swinging of said lower sheave 42 permits it to properly aline with the upper forward guide sheave 29 whose vertical plane changes when the arm 25 swings on the pivotal mounting 26. The rear guide sheave 32 is also carried by the swinging arm 25 so it will always be alined with the forward upper sheave 29. The arm 25 may move in arcs in a horizontal plane very freely due to the fact that the roller 35, carried by the overhanging gooseneck 33, rides on the flat track 24 on the deck 22. The cable 15 leaves the sheave 32 so as to extend downwardly adjacent to the rear side of the winch drum.

As the winch drum revolves for winding purposes, the cable will wind thereon very evenly, as shown in Fig. 4, and the arm 25 freely swings relative to the longitudinal extent of the drum to permit the cable to wind up on the drum in neat, successive convolutions without piling up on any portion of the drum. It will be noted that there is a very short vertical distance between the upper rear guide sheave 32 and the drum 14. As a result, the cable follows very freely during winding operations, resulting in excellent level winding, and the cable is thereby prevented from piling up at the ends of the drum because of the ease with which the swinging arm 25 will reverse its direction of movement. The inner faces of the end heads of the drum are suitably beveled or inclined to aid in the prevention of cable piling at the ends of the drum.

The compactness of the winch and the level winding device assembly is particularly desirable and the assembly is low and non-protruding. The assembly is readily mounted in a relatively small space on the chassis of a motor truck between the front bumper bar and the radiator.

From the foregoing description it will be seen that the improved level winding device for winch drums is of simple, novel and compact construction, and is well adapted for the purposes set forth.

What is claimed as the invention is:

1. In combination with a revoluble drum, a cable level winding device, comprising a frame rigidly mounted adjacent the drum and formed with a flat plate portion having opposed face portions, an arm swingable across one face of said plate portion, means pivotally connecting one end portion of said arm to said frame, the free end portion of the arm being swingable adjacent the axis of the drum, a gooseneck formed on the free end portion of the arm and movably embracing an edge portion of said frame plate, anti-friction means carried by said gooseneck and engaging the other face portion of said plate, sheaves revolubly mounted on opposite end portions of the arm, a sheave revolubly and swivelingly mounted in spaced relation to the pivotally connected end of the arm, and a cable engaging all of said sheaves and extending to the drum for level winding thereon.

2. In combination with a revoluble drum, a cable level winding device, comprising an upright frame rigidly mounted adjacent the drum and formed with an elevated, horizontal flat plate having upper and lower faces, an arm swingable horizontally across the under-face of said plate, means pivotally connecting one end portion of

said arm to said frame, the free end portion of the arm being swingable adjacent the axis of the drum, a gooseneck formed on the free end portion of the arm and overhanging the top face of said plate, a roller journalled on said gooseneck and riding on top face portions of the plate, sheaves revolubly mounted on opposite end portions of the arm, a sheave revolubly and swivelingly mounted on the frame below the pivotally connected end of the arm, and a cable engaging all of said sheaves and extending to the drum for level winding thereon.

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