

[54] **WINCH FOR USE ON SAILBOATS**

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[22] Filed: **Apr. 3, 1972**

[21] Appl. No.: **240,498**

[52] U.S. Cl. **254/150 R, 114/218, 254/175.5**

[51] Int. Cl. **B66d 1/30**

[58] Field of Search **254/150, 186, 15 R, 254/180, 175.5, 175.7; 114/218**

[56] **References Cited**

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[57] **ABSTRACT**

A winch is disclosed including a flat base plate for supporting an upright cylindrical idler along with a flat pivot arm which in turn carries a ratchet drum. As supported, a halyard, sheet, or the like, passes less than a full turn about the drum in a relationship such that the tension in the halyard applies a force to the drum, clampingly engaging the sheet between the drum and the idler. An extension pin adjacent the drum prevents fouling and a handle (incorporating a ratchet) engages the drum to actuate the drum and the pivotal mounting so as to accomplish various operations.

8 Claims, 4 Drawing Figures

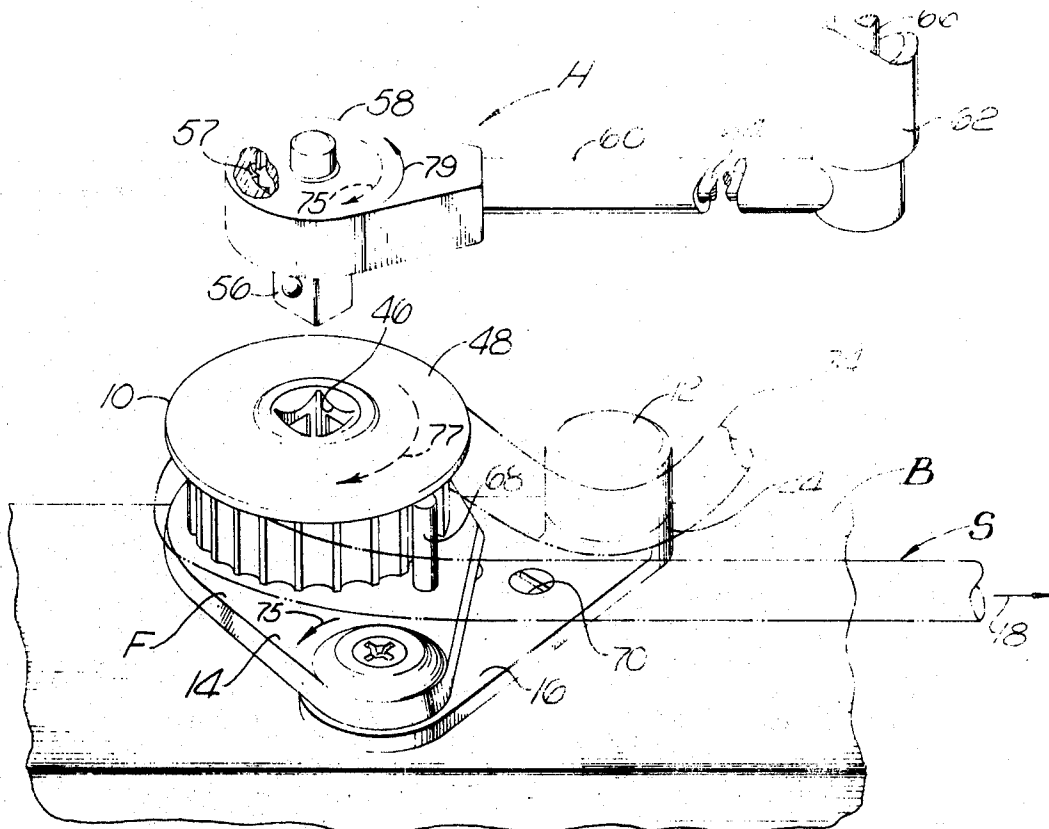


Fig. 1.

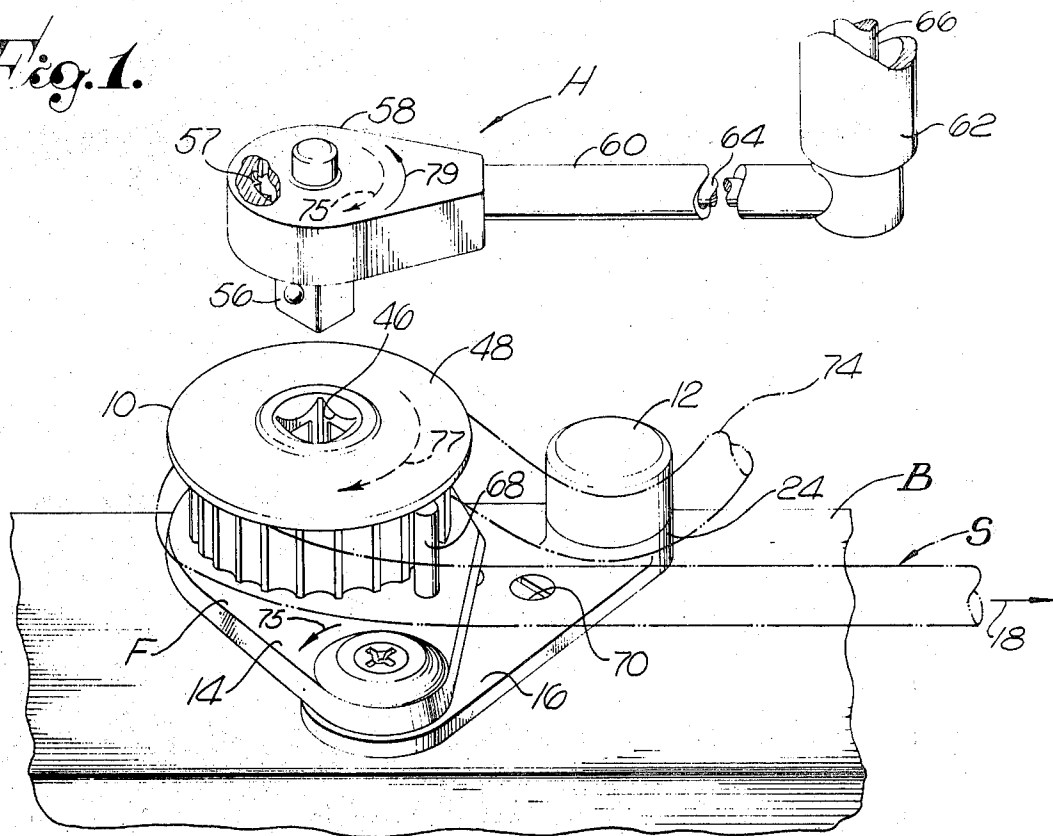


Fig. 2.

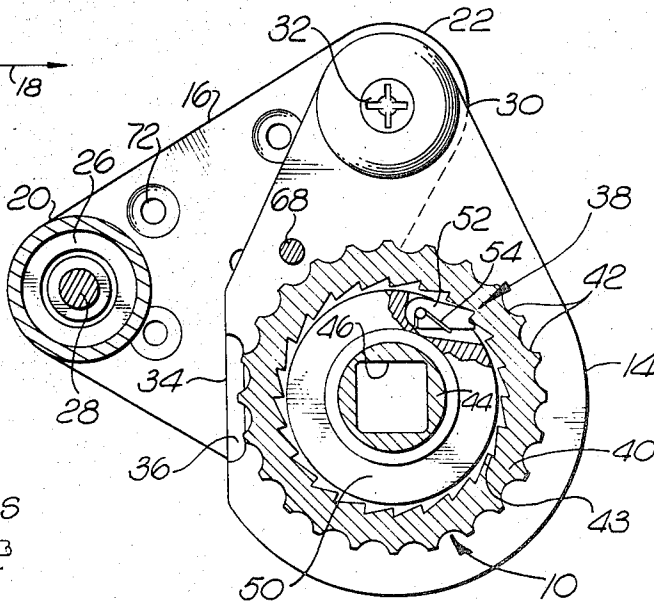


Fig. 3.

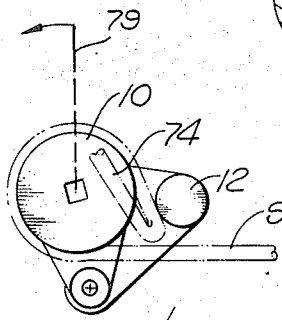


Fig. 4.

WINCH FOR USE ON SAILBOATS

BACKGROUND AND SUMMARY OF THE INVENTION

Since time immemorial, various forms of winches have been employed on sailboats. Although widespread application for such winches has continued to exist over the years, relatively few basic changes have been made in these structures. At present, pleasure craft provide the major demand for such winches. Generally in such an application, a winch should be easy to operate, durable, and easy to maintain. Additionally, and perhaps of greater significance, such a winch should be effective in cooperation with a sheet or the like, and should facilitate very rapid performance of various operations. Within the purview of such considerations, the unit hereof represents a significant development in the form of a considerably improved winch for use on sailboats.

Generally, the winch of the present invention incorporates a drum that is carried on a flat pivotally-mounted arm which in turn is facingly affixed to a flat base plate that also supports an idler. The base plate is adapted to be affixed at a stationary location on a sailboat. In using the winch, as with a sheet for example, less than a full turn of the sheet extends engagingly about the peripheral non-slip surface of the drum, passing between the drum and the idler. As the sheet becomes stressed, in tension, the drum (by pivotal movement) is drawn into firm engagement with the idler to develop a cleating action that is proportional to the sheet tension. A handle is employed in engagement with the drum, to ease the sheet by swinging the arm pivotally, to move the drum away from the idler. A somewhat similar operation is involved to cast off the sheet. Winching is also performed with the handle. A ratchet mechanism in the handle facilitates the various operations and an extension fixed to the pivot arm at a location adjacent to the drum avoids fouling with regard to the drum.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which constitute a part of this specification, an exemplary embodiment demonstrating various objectives and features hereof is set forth, as follows:

FIG. 1 is a partly exploded perspective view of a winch constructed in accordance with the present invention and embodying the principles thereof;

FIG. 2 is a partially sectioned plan view of the winch of FIG. 1;

FIG. 3 is a diagrammatic plan view illustrative of one mode of operation for the winch of FIG. 1; and

FIG. 4 is a diagrammatic plan view illustrative of another mode of operation for the winch of FIG. 1.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, a detailed illustrative embodiment of the invention is disclosed herein. The embodiment exemplifies the invention which may, of course, be embodied in other forms, some of which may be radically different from the illustrative embodiment as disclosed. However, the specific structural and functional details disclosed herein are representative and they provide a basis for the claims which define the scope of the present invention.

Referring initially to FIG. 1, there is shown a winch unit F that is affixed to a boat B for operation with a sheet S, oriented as indicated. The structure is viewed from the outboard side, and as indicated, the winch unit F may be operated by a disengageable handle H. Generally, the sheet S is bent clockwise around a drum 10, so that the sheet exits between the drum 10 and a rotary idler 12. The drum 10 is supported on a pivotally-mounted flat arm 14 which in turn is supported by a base plate 16 that also supports the idler 12. Generally, in the operation of the winch, tension in the sheet S (indicated by an arrow 18) applying a force to draw the drum 10 toward the idler 12 thereby clamping the sheet S between those members and applying a force to cleat the sheet. With the sheet S so positioned, it is automatically tailed and continuously cleated, and furthermore, the sheet may be easily winched, eased, or cast off.

Considering the structure in somewhat greater detail, the base plate 16 is generally flat, and, somewhat of a right-angle triangular shape, (FIG. 2) having acute-angle rounded corners 20 and 22. The corner 20 defines a raised, circular base support 24 (FIG. 1) which abuts the idler 12 in axial alignment. The idler is supported on a bearing 26 (FIG. 2) and affixed to the plate 16 by a stud 28.

The base plate 16 pivotally receives the arm 14 at the arcuate corner 22 of the plate 16. The arm 14 is somewhat pear shaped terminating at its smaller end 30 with a radius which is matingly aligned with the radius of the corner 22. A spacing fastener 32 pivotally affixes the members together whereby the arm 14 may swing pivotally from the position illustrated to a location (not illustrated) in which an edge 34 of the arm 14 abuts the support 24, so that an indentation 36 receives a small portion of the idler 12. Thus, according to the pivotal displacement of the arm 14, the drum 10 is variously positioned with reference to the idler 12.

The drum 10 is rotatably affixed to the arm 14 in concentric relationship with a ratcheting mechanism 38 (FIG. 2). The drum 10 includes an external wall 40, the outside cylindrical surface of which defines flutes 42 for gripping the sheet. Concentric with the wall 40, an internal wall 44 defines an internal handle-engaging socket 46. The two walls 40 and 44 are joined as an integral unit by a cap 48 (FIG. 1) extending across the top of the drum 10.

The space between the walls 40 and 44 telescopically receives a pawl-supporting cylinder 50 (FIG. 2) which supports a pawl 52 for engaging the ratchet wheel 43 under the force of a spring 54 as well known in the art. Thus, as depicted in FIG. 2, the drum 10 may be revolved in a clockwise direction or swing about the pivotal mount of the fastener 32 with reference to the base plate 16.

In moving the drum 10, the handle H (FIG. 1) may be utilized. Specifically, the handle includes a square coupling 56 for mating engagement with the socket 46. The stud 56 is mounted in a ratchet mechanism 57 embodied in a housing 58. Generally, the ratchet mechanism may be similar to that illustrated in FIG. 2; however, the handle ratchet enables the square coupling 56 to be forcefully revolved only in a clockwise direction as viewed from the top.

The housing 58 of the handle H also receives a lever arm 60 which terminates in a normally-extending grip 62. The lever arm 60 and the grip 62 contain locking

linkages 64 and 66, respectively, which may be actuated to lock the ratchet mechanism embodied in the housing 58. That is, when the ratchet in the handle is locked, the square coupling 56 is rigid in relation to the handle.

In the manufacture of a unit in accordance herewith, various forming techniques may be employed. Generally, in one successful operating embodiment, the component parts of the unit F have been formed of an aluminum alloy using casting techniques. Upon completion of the component parts by such techniques, the cylinder 50 is rigidly fixed to the arm 14 as by press-fitted pins (not shown) entering the cylinder 50. The drum 10 is next fitted over the cylinder 50 and locked for rotation on the arm 14 as by a snap ring (not shown). An extension pin 68 is also affixed to the arm 14 to obstruct the path around the exterior of the drum 10. Specifically, the pin 68 is positioned just beyond the point at which the sheet S departs from the drum 10 to pass about the idler 12. The subassembly of the arm 14 is next affixed to the base plate 16 by the pivot fastener 32. Also, the stud 28 (FIG. 2) is affixed to the plate 16 along with the bearing 26 and the idler 12.

To install the apparatus, a set of wood screws 70 (FIG. 1) are passed through counter sunk bores 72 in the base plate 16, to be anchored in the boat B. Note that the unit is mounted in such a manner that the sheet S is received at a location substantially adjacent to the pivotal fastener 32.

In using the winch, a halyard or the sheet S is bent clockwise around the drum 10 (FIG. 1) contacting the drum for approximately three-quarters of a turn. Then, the sheet S is passed to engage the idler 12 so that the tail 74 falls inboard. With the application of a force as indicated by the arrow 18 to stress the sheet S, the drum 10 pivotally swings so that the sheet S is clampingly engaged between the flutes 42 and the idler 12. Diagrammatically, that condition is represented in FIG. 3, in which it may be seen that as the force of the arrow 18 increases, the forceful engagement between the drum 10 and the idler 12 also increases with the result that the sheet is automatically tailed and continuously cleated. Of course, the winch may be actuated by using the handle H to revolve the drum 10 while in the configuration of FIG. 3 as indicated by the dashed line arrows 75 and 77 (FIG. 1). Referring to FIG. 3, as the winch drum 10 is revolved by a force indicated by a dashed line 78, the sheet S is drawn against the force of the arrow 18 by the gripping engagement between the drum 10 and the idler 12.

In the event that it is desired to ease the sheet, the handle H is employed to swing the drum 10 a slight distance away from the idler 12. That is, by locking the handle ratchet, the drum 10 may be revolved in a counterclockwise direction as indicated by the arrow 79 (FIG. 1) which is opposed to the ratchet mechanism built in the drum 10. Consequently, the drum 10 swings about the pivot, opening the space between the drum 10 and the idler 12 and releasing the grip on the sheet S, allowing the sheet to be eased.

To cast off, the sheet tail 74 (FIG. 4) is positioned

over the top of the drum at the idler as illustrated. Next, the drum is again moved in a counterclockwise direction as explained above, to separate the drum from the idler 12. As a consequence, the sheet is stripped from the winch in a simple, clean operation.

In general, the winch hereof is effective to provide a cleating force which is proportional to the sheet tension. Also, a somewhat related consideration is the fact that the unit does not involve a multiplicity of turns as with a conventional winch. Consequently, the unit may be rapidly stripped and there is less opportunity for fouling. It is also to be noted, that the sheet is rather simply guided through the structure hereof. That is, after passing about the drum 10 the sheet S is stripped therefrom by the pin 68 with the result that fouling is exceedingly unlikely. In view of these considerations, the structure hereof enables significant advantages for a sailboat winch. Recognizing that the structure may be variously embodied and implemented, as will be readily apparent to those skilled in the art, the scope hereof shall be as defined by the claims set forth below.

What is claimed is:

1. A winch for use on a sailboat, for use in cooperation with a sail sheet or halyard, comprising:
 - a base plate adapted to be rigidly affixed to said boat;
 - an idler roller affixed to extend perpendicularly from said base plate;
 - a ratchet drum mechanism affixed to extend perpendicularly from said base plate whereby to receive said halyard in cooperation with said idler roller;
 - pivotal means for accommodating a swing movement for variously positioning said drum with reference to said idler; and
 - means for applying rotary forces to said drum to revolve said drum and to move said pivotal means whereby to vary the space between said idler roller and said ratchet drum.
2. A winch according to claim 1 wherein said ratchet drum includes a cylindrical surface defining symmetrical flutes for gripping irregularities.
3. A winch according to claim 1 further including key means to limit the degree of swing movement between said roller and said drum.
4. A winch according to claim 1 further including a blocking extension affixed to said pivotal means to obstruct a circumferential path about said ratchet drum.
5. A winch according to claim 1 wherein said means for applying rotary force includes a coupling affixed in said drum and handle means for engaging said coupling.
6. A winch according to claim 5 wherein said handle means further includes a ratchet means and means for locking said ratchet means.
7. A winch according to claim 1 wherein said idler roller includes a rotary bearing for free rotation thereof.
8. A winch according to claim 1 wherein said pivotal means allows preset positional relationships between said drum and said roller to continue until altered by externally-applied forces.

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