Oct. 25, 1966 R. A. RICHARDSON 3,281,120

WINCH ASSEMBLY

Filed March 30, 1964

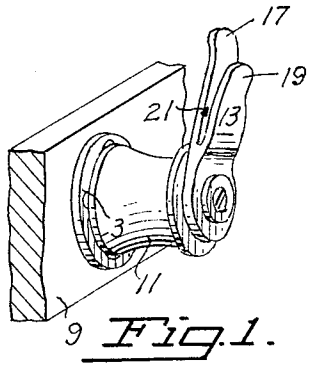


Fig. 1.

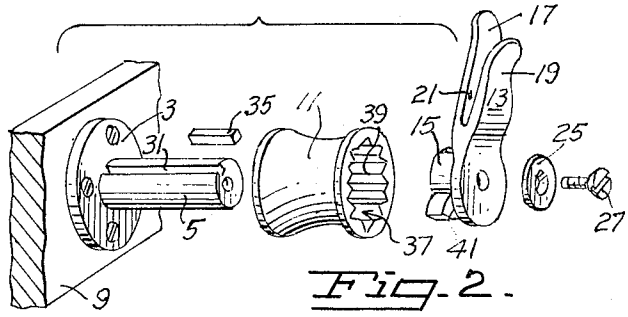


Fig. 2.

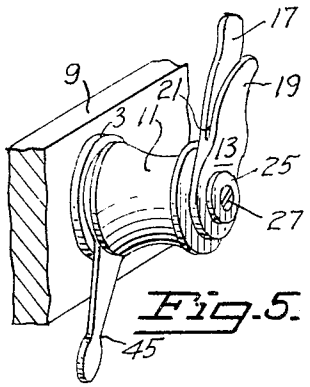


Fig. 5.

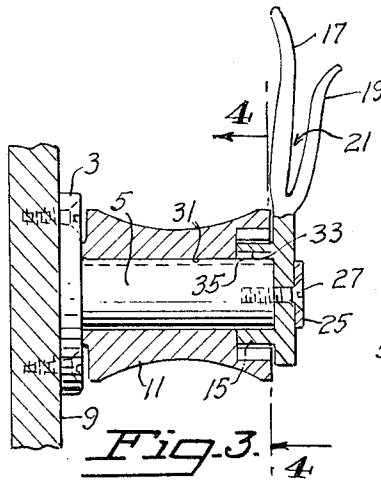


Fig. 3.

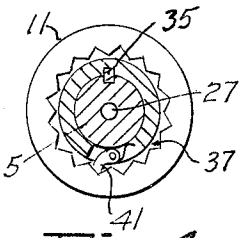


Fig. 4.

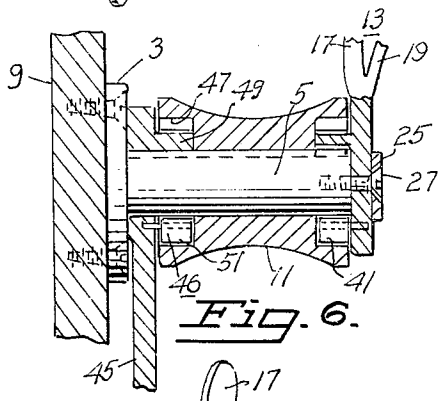


Fig. 6.

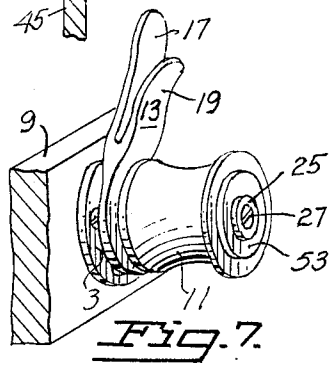


Fig. 7.

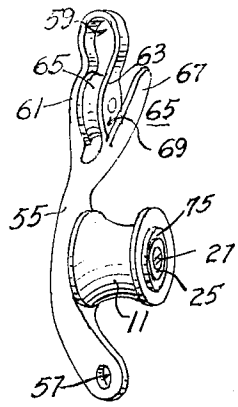


Fig. 8.

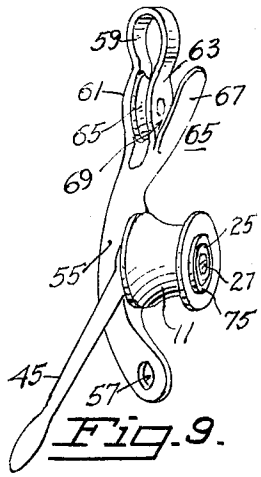


Fig. 9.

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3,281,120

WINCH ASSEMBLY

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8 Claims. (Cl. 254—150)

My invention relates to a winch apparatus and more particularly to a winch assembly adaptable for use on small water craft such as sailboats; and will be described with respect thereto, though the invention is not necessarily limited to such field of use.

In effecting operations of a sailboat, the sail, in addition to other factors, must be constantly manipulated with respect to prevailing wind conditions, as for example when prevailing wind conditions change, or the navigator wants to change course.

This is conventionally accomplished by wrapping a boom line one or two turns about a winch drum, and drawing in or relaxing the line, depending on the position or change desired, following which, the free or loose end of the line is hitched to a nearby post or conventional cleat, to hold the sail position until another change is desired.

When such change is deemed necessary, either by reason of a change in wind conditions or a desire to change course, the time factor usually becomes important, as the change of sail position must be effected rapidly, and if the operator has to divide his attention and his movements between a winch at one location and a hitch or cleat at another location, the rapidity at which changes may be made is adversely affected.

Among the objects of my invention are:

(1) To provide a novel and improved winch assembly;

(2) To provide a novel and improved winch assembly with intimately associated hitching means; and

(3) To provide a novel and improved winch assembly with hitching means incorporated in the winch assembly;

Additional objects of my invention will be brought out in the following description thereof, with reference to the accompanying drawings, wherein:

FIGURE 1 is a three dimensional view of one embodiment of my invention;

FIGURE 2 is an exploded view of the embodiment of FIGURE 1;

FIGURE 3 is a longitudinal view in section through the embodiment of FIGURE 1;

FIGURE 4 is a view taken in the plane 4—4 of FIGURE 3;

FIGURE 5 is a three dimensional view depicting the embodiment of FIGURE 1 with a crank arm added;

FIGURE 6 is a longitudinal view in section through the embodiment of FIGURE 5;

FIGURE 7 is a three dimensional view depicting a modification of the embodiment of FIGURE 1;

FIGURE 8 is a three dimensional view illustrating an adaptation of the present invention.

FIGURE 9 is a view depicting the embodiment of FIGURE 8 with the addition of a crank arm.

Referring to the drawings for details of my invention, the winch assembly of FIGURES 1–4, comprises a base member **3** having a short shaft or spindle **5** extending therefrom. The base member may have screw holes therethrough for mounting of the base to a structural member of the boat, such as a crossbar **9** spanning the hull within convenient reach of the tiller. A suitable winch drum **11** is rotatably mounted on this shaft, and to the free end of the shaft is affixed a cleat **13**.

The cleat includes a hub **15** and a pair of cleat arms **17** and **19** extending substantially radially therefrom, at a wedge angle **21** to each other, with one of the cleat arms **17** longer than the other to constitute a guide for facilitating the insertion of a line or rope ino the wedge angle formed by such arms.

The cleat is held to the shaft end, preferably by a washer **25** disposed against the exposed side of the cleat, and a flathead screw **27** passing through the washer and threadedly engaging the free end of the shaft **5**.

The cleat should be maintained against rotation with respect to its mounting shaft, and this may readily be accomplished by providing the shaft and the interior of the cleat hub with matching key slots **31**, **33** respectively and locking the cleat to the shaft by a suitably fitting key **35**.

The winch drum should be rotatable in one direction only, namely in the clockwise direction for a right-handed navigator; and accordingly, to block rotation in the reverse direction while permitting rotation in the desired direction, the winch drum at that end adjacent the cleat, is formed with a ratchet cavity **37** involving a plurality of ratchet teeth **39** about the peripheral wall of such cavity.

For cooperation with such ratchet teeth, I provide in the hub or the cleat, a spring-loaded pawl **41** which, upon assembling the cleat onto its supporting shaft, is pressed down to accomplish its insertion into the ratchet cavity, where it will then engage and maintain engagement with the teeth, as the drum is rotated in the permitted direction, while opposing rotation in the reverse direction.

In some installations it may be desirable, and in any event, would be more convenient, not to have to exert manual pull on the line when such pull becomes necessary, and in this connection, I contemplate including in the winch assembly, means for cranking the winch drum. This may be readily accomplished by adding a crank handle **45** to the shaft, preferably adjacent the other or base end of the winch drum, and coupling the same to the winch drum as by a pawl and ratchet coupling **46**, which may, in all respects, be like that which couples the winch drum to the cleat. When such crank means is included, the drum will then also have a ratchet cavity **47** at its base end, and the adjacently disposed crank handle will have a hub **49** extending into the cavity, with a spring-loaded pawl **51** installed in such hub.

The embodiment of FIGURE 7 represents a modified version of the device of FIGURE 1, the cleat **13** having been installed adjacent the base end of the winch drum, where it will be keyed to the shaft to maintain its position. Rotation of the drum in the one direction will be blocked by providing a closure **53** which will be formed with a hub and provided with a pawl to engage ratchet teeth in a ratchet recess in the proximate end of the drum, all in the manner of the cleat **13** of FIGURE 1.

In addition to the embodiments illustrated and described above, where the winch drum is permanently affixed by means of a screw mounted base, to a structural member, the present invention may be embodied in a portable unit (FIGURE 8 and 9) that can be used in a block and tackle system.

In such portable unit, the base **55** is preferably in the form of an elongated casting having an eye **57** at one end, and an eye **59** at its other end. Adjacent one end, the base is cast with an elongated opening creating parallel spaced walls **61**, **63**, between which a sheave **65** is rotatably journalled. One of the sheave supporting walls **63** functions additionally, as one arm of a cleat **65**, the other arm **67** being also formed integrally with the base casting at a wedge angle **69** with respect to that particular wall **63**.

In this embodiment, the spring-loaded pawl **41**, which permits rotation of the drum into one direction while obstructing rotation in the opposite direction, will be installed in the hub of a closure **75** for the exposed end of the drum, the closure being keyed to the shaft and held thereto by a countersink washer and screw in the same

manner as the cleat of the first described embodiment of the invention.

If a crank handle **45** is to be included in this latter embodiment, it can be installed in the manner described in connection with the embodiment of FIGURE 5.

In utilizing the embodiments of FIGURES 8 and 9, the sheave **65** will form one end of a block and tackle system, with a sheave at its other end. This latter sheave could be anchored to a fixed anchorage, while a load could be connected through the eye **57** of the base **55**. With one end of a block and tackle line affixed to the base **55** through the eye **59**, and the line then passed around the sheaves in the system, the free end of the line will then be wrapped one or two turns about the drum and then cinched in the cleat to maintain prevailing tension in the system.

From the foregoing description of my invention, it will be apparent that it fulfills all the objects of my invention, and while I have illustrated and described the same in considerable detail, I do not desire to be limited in my protection to the specific details illustrated and described except as may be necessitated by the appended claims.

I claim:

1. A winch assembly comprising:
a base member having a shaft extending therefrom, with said shaft fixed against rotation relative to said base member,
a drum rotatably mounted on said shaft,
a cleat non-rotatably secured to said shaft adjacent an end of said drum, said non-rotatable cleat having a wedge angle substantially normal to said shaft,
and means blocking rotation of said drum in one direction while permitting rotation in the opposite direction.

2. A winch assembly comprising:
a base member having a shaft extending therefrom, with said shaft fixed against rotation relative to said base member,
a drum rotatably mounted on said shaft,
a cleat non-rotatably secured to said shaft adjacent an end of said drum,
said non-rotatable cleat extending substantially normal to said shaft and including a hub and pair of cleat arms extending therefrom at a wedge angle to each other for the insertion and cinching of a rope between said arms,
and means blocking rotation of said drum in one direction while permitting rotation in the opposite direction.

3. A winch assembly comprising:
a base member having a shaft extending therefrom,
a drum rotatably mounted on said shaft,
a cleat fixedly secured to said shaft adjacent an end of said drum,
said cleat including a hub and pair of cleat arms extending therefrom at a wedge angle to each other to receive and cinch a rope,
and means for facilitating the insertion of a rope between said arms,
and means blocking rotation of said drum in one direction while permitting rotation in the opposite direction, said means including
a plurality of ratchet teeth at the end of said drum adjacent said cleat, and
a spring loaded pawl on said cleat, said pawl being in meshing engagement with said ratchet teeth.

4. A winch assembly comprising:
a base member having a shaft extending therefrom,
a drum rotatably mounted on said shaft,
a cleat fixedly secured to said shaft adjacent an end of said drum,
said cleat including a hub and pair of cleat arms extending therefrom at a wedge angle to each other to receive and cinch a rope, and with one of said arms rearwardly of and longer than the other to constitute a guide for the insertion of a rope between said arms,

and means blocking rotation of said drum in one direction while permitting rotation in the opposite direction, said means including
a plurality of ratchet teeth at the end of said drum adjacent said cleat, and
a spring loaded pawl on said cleat, said pawl being in meshing engagement with said ratchet teeth.

5. A winch assembly comprising:
a base member having a shaft extending therefrom, said shaft being fixed against rotation relative to said base member,
a drum rotatably mounted on said shaft,
a cleat non-rotatably secured to said shaft adjacent an end of said drum,
said non-rotatable cleat extending substantially normal to said shaft and including a hub and pair of cleat arms extending therefrom at a wedge angle to each other to receive and cinch a rope, and means for facilitating the insertion of a rope between said arms,
means blocking rotation of said drum in one direction while permitting rotation in the opposite direction,
and means for cranking said drum in the direction of permissible rotational movement.

6. A winch assembly comprising:
a base member having a shaft extending therefrom, with said shaft fixed against rotation relative to said base member,
a drum rotatably mounted on said shaft,
a cleat non-rotatably secured to said shaft adjacent an end of said drum,
said non-rotatable cleat extending substantially normal to said shaft and including a hub and pair of cleat arms extending therefrom at a wedge angle to each other for the insertion and cinching of a rope between said arms.

7. A winch assembly comprising:
a base member having a shaft extending therefrom, with said shaft fixed against rotation relative to said base member,
a drum rotatably mounted on said shaft,
a cleat non-rotatably secured to said shaft adjacent an end of said drum,
said non-rotatable cleat extending substantially normal to said shaft and including a hub and pair of cleat arms extending therefrom at a wedge angle to each other, and means for facilitating the insertion and cinching of a rope between said arms.

8. A winch assembly comprising:
a base member having a shaft extending therefrom, with said shaft fixed against rotation relative to said base member,
a drum rotatably mounted on said shaft,
a cleat non-rotatably secured to said shaft adjacent an end of said drum,
said non-rotatable cleat extending substantially normal to said shaft and including a hub and pair of cleat arms extending therefrom at a wedge angle to each other and with one of said arms rearwardly of and longer than the other to constitute a guide for the insertion of a rope between said arms.

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