April 10, 1962 W. CHILD 3,029,041

WATER-SKIING TOW ROPE REELING DEVICE

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Fig. 1.

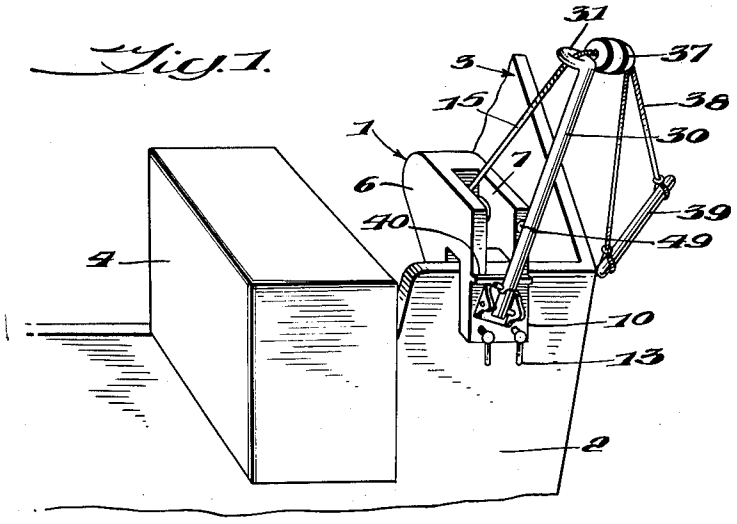


Fig. 2.

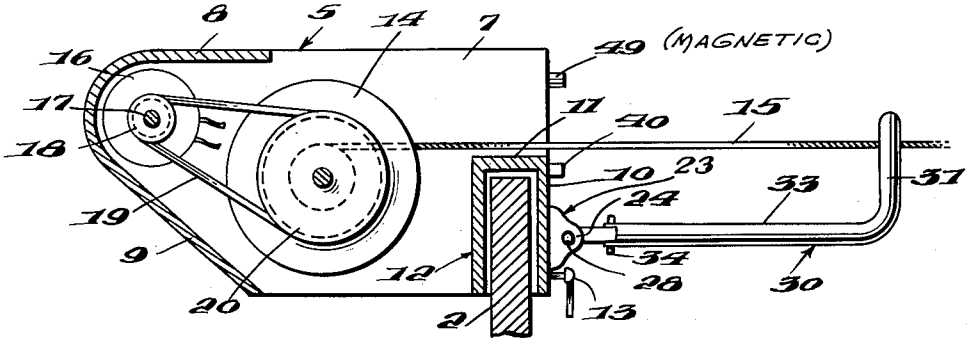
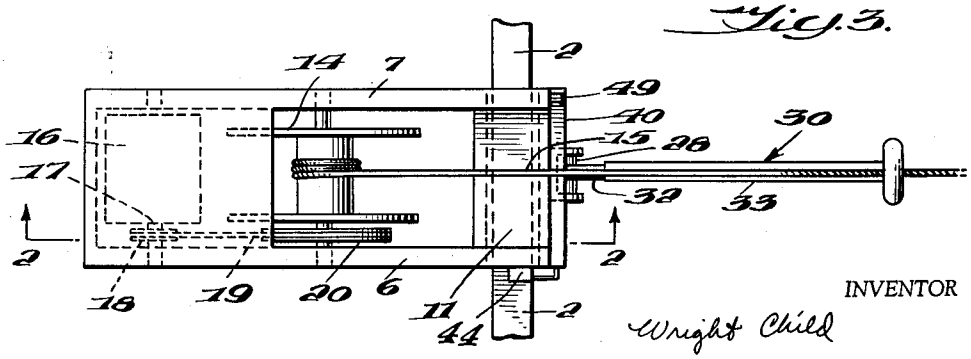


Fig. 3.



INVENTOR

Wright Child

BY Price, Scheffler & Parker

ATTORNEYS

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Fig. 4.

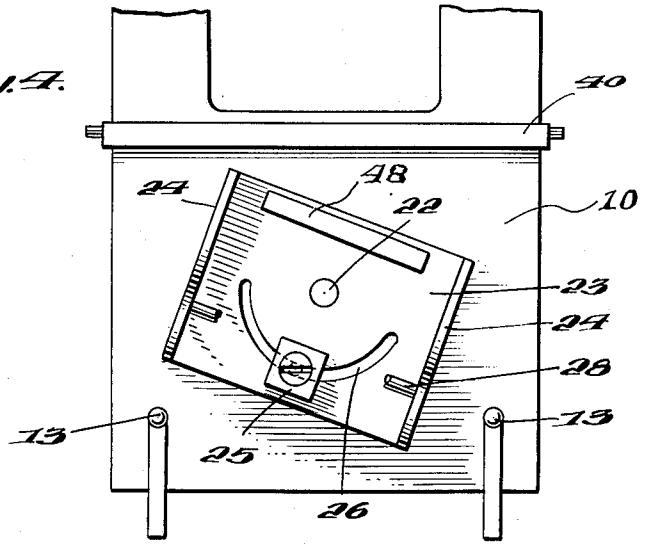


Fig. 5.

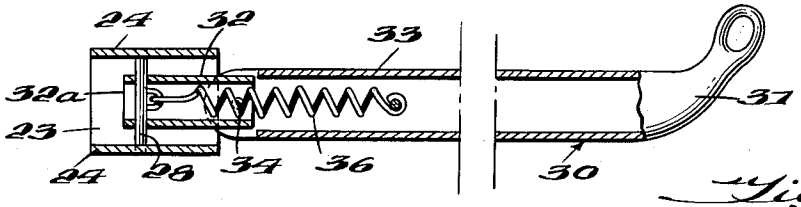


Fig. 7.

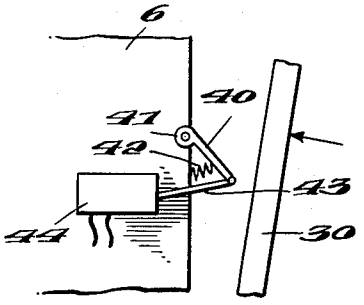


Fig. 6.

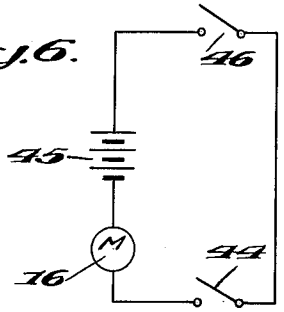


Fig. 8.

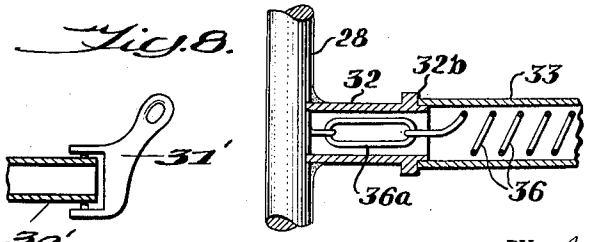


Fig. 9

INVENTOR

Wright Child

BY Pierce, Scheffler & Parker

ATTORNEYS

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3,029,041
WATER-SKIING TOW ROPE REELING DEVICE

Wright Child, 5382 Knollcrest, Murray, Utah

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3 Claims. (Cl. 242—86.5)

This invention relates generally to a water-skiing tow rope reeling apparatus, and more particularly to a motor driven apparatus for reeling in a water-skiing tow rope loosely towed behind a boat, which apparatus will be automatically de-energized when the tow rope is completely wound upon the reel.

With the development of relatively inexpensive outboard motors of high horsepower (25 horsepower and up) and the corresponding increasing popularity of boating as a recreational pastime, the sport of water skiing has seen a remarkable growth. However, due to the increased number of boats utilizing areas (lakes, streams, etc.) of limited size for water skiing, careful attention must be given to water courtesy, proper traffic patterns, and the like.

In the sport of water skiing the pulling in of a tow rope at the end of a ski ride has always presented a problem in the past. For example, when a skier has fallen during a ski ride, the operator is desirous of returning to the skier as promptly as possible. The operator may either stop the boat to pull in the loose tow rope before returning to the skier so that the end of the coiled rope may be thrown to the fallen skier, or the operator may go directly to the skier and partially circle him to get the rope to him. In narrow water areas where navigation is difficult it is not always possible to circle the skier, and the danger lies of getting the tow rope caught in the propeller of the towing boat. It is also undesirable to leave the tow rope played out from the boat for any length of time, since the rope might be inadvertently cut by the propeller of another boat or might snag on some obstruction. Finally, in the past it has been necessary for the operator to be assisted by another person in pulling in tow rope while the boat operator maintains the boat in a desired position, or else it has been necessary for the operator to shift the motor to neutral and to climb back to the rear of the boat and pull in the tow rope himself.

The primary object of the present invention is to provide a motor-driven reeling device in a water-skiing tow rope while the boat is either stationary or in motion.

Another object of my invention is to provide a motor-driven water-skiing tow rope reeling device which will automatically be de-energized when the tow rope is completely wound in upon the reel.

Another object of my invention is to provide a water-skiing tow rope reeling device which, after the rope is completely reeled in upon the reel, will position the rope handles at one side of the rear end of the boat above the water line for simple access by a prospective skier.

Still another object of my invention is to provide an electric-motor-driven tow rope reeling device having a guide arm which is pivoted upwardly when the rope is completely wound upon the reel to simultaneously de-energize the drive motor and to position the tow rope handle to one side of the rear end of the boat above the water-line thereof.

Other objects and advantages of my invention will become more apparent from a study of the following specification when considered in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of the tow rope reeling device with the rope in its fully wound state on the reel;

FIG. 2 is a sectional view of the reeling device taken along line 2—2 of FIG. 3;

FIG. 3 is a plan view of the apparatus with the tow rope substantially completely unwound;

FIG. 4 is a detail elevational view of the hinge bracket with the guide arm removed;

FIG. 5 is a longitudinal sectional view of a guide arm modification having a hingedly connected eyelet;

FIG. 6 is a schematic wiring diagram of the electrical system;

FIG. 7 is a detailed diagrammatic illustration of the operation of the switch operating bar by the guide arm;

FIG. 8 is a detailed elevational view of another guide arm embodiment, and

FIG. 9 is a fragmentary detailed view of a further embodiment of the invention.

Referring first more particularly to FIG. 1, the tow rope reeling device **1** is clamped to the transom **2** of a boat **3**. While the boat has been illustrated as being of an outboard type having a motor **4** secured to the transom, it will be obvious that the invention is also applicable to inboard motor boats as well.

The reeling device includes a casing **5** having side walls **6, 7**. At the forward end the casing has a top wall **8**, and a front wall **9**. At its rearward end the casing includes a back wall **10** rigidly secured intermediate the side walls **6, 7**. As shown in the drawings, this back wall **10** extends only partially upwardly for the height of the side walls and merges with the transom-connecting horizontal wall **11** and downwardly depending vertical wall **12**. The walls **10, 11** and **12** in cross-section form an inverted U-shaped channel aligned with corresponding openings in the side walls **6, 7** so that the device may be fitted downwardly upon the transom **2** for clamping thereto by means of the clamping bolts **13**.

Rotatably mounted in fixed journals between the side walls **6, 7** is the tow rope reel **14** upon which is wound the tow rope **15**. Rigidly mounted within the forward end of the housing **5** is the electric motor **16** having a shaft **17** to which is rigidly secured the pulley **18**. By means of endless belt **19** wound upon motor pulley **18** and pulley **20** secured to the reel **14**, the reel may be driven by the motor in a direction to wind the tow rope **15** thereon.

While pulley-belt means have been illustrated for driving the tow rope reel by the motor shaft, it is apparent that various other drive connecting means—such as gearing means, friction rollers, motor reduction gearing, or direct shaft drive—could be used equally as well.

Pivotally connected to the rear wall **10** about fixed pivot pin **22** (FIG. 4) is the hinge bracket **23** having spaced side flanges **24**. The angular position of the bracket **23** relative to rear wall **10** may be fixedly set within a range of approximately 160° by means of the bolt **25** which extends through slot **26** in the bracket for threaded engagement with a threaded bore in the rear wall **10**. As will be explained in greater detail below, the angular position of the bracket **23** about pivot axis **22** may be set as desired to cause the guide arm **30** and tow rope handle **39** to extend over the adjacent side of the rear end of the boat regardless of on which side of the motor **4** the device is secured to the transom **2**.

Hingedly connected to the bracket **23** by means of hinge pin **28** journalled in flanges **24** is the tow rope guide and lifting arm **30**. The guide arm **30** terminates at its extremity in an offset guide eyelet **31**. In the embodiment illustrated in FIG. 8, the guide eyelet **31'** may be hingedly connected to the free extremity of the guide arm **30'**.

As shown in FIG. 5, the guide arm **30** consists of two sections **32, 33** pivotally connected together by pivot pin **34**. The hinge pin **28** and the pivot pin **34** constitute a universal joint. While the axes of pins **28** and **34**

have been illustrated as being substantially at right angles to each other relative to the longitudinal axis of the arm 30, this need not always be the case. Coil spring 36 is secured at one end to hinge pin 28 and at the other end to arm section 33; this coil spring functions (together with gravity) to normally cause the arm 30 to be in its horizontal position illustrated in FIGS. 2 and 3. It should be mentioned that when arm 30 is in its horizontal position shown in FIG. 2, the extremity 32*a* of section 32 abuts against the head of bolt 25 which serves as a stop against further downward pivotal movement of the arm.

As will be explained in greater detail below, when the tow rope 15 is reeled in upon reel 14, the float 37 secured to the tow rope adjacent the bridle 38 of the handle 39 will engage the eyelet 31 and pivot the arm 30 upwardly to the position shown in FIG. 1. When the arm 30 reaches this position, it engages switch operating bar 40 which is pivotally connected to the casing side walls by pivots 41 (see FIG. 7). Spring means 42 normally biases switch operating bar 40 outwardly from the rear wall 10. When guide arm 30 engages switch operating bar 40 and pivots the same in the clockwise direction in FIG. 7, connecting rod 43 will be moved to the left to open the normally-closed contacts of switch 44 secured to the casing side wall 6.

Referring now to the electrical wiring diagram of FIG. 6, the motor 16 and switch 44 are connected in series with the battery 45. Also connected in series with the battery is the main switch 46 which is located on the boat for operation by the driver thereof or by an assistant supervising the water skier. The reel driving motor illustrated is of a low horsepower direct-current type adapted to reel in approximately 90 feet of tow rope in 6 seconds with the boat in motion. It is apparent, however, that other types of motive power means could be used equally as well.

When the guide arm 30 has been raised to the position of FIG. 4 it contacts the magnetic latch 48 on the bracket 23 whereby the arm will be retained in place by the magnetic attraction between the arm 30 and the magnetic latch 48. As an alternative, the magnetic latch 49 may be positioned on the end of side wall 7 (as shown in FIGS. 1–3) for engagement by the arm in its raised position of FIG. 1.

The operation of the ski tow rope reel device may now be described.

Assume first that the tow rope is completely unwound from the reel 14 and a water skier is being towed by the boat. The entire tension of the tow rope will be on the reel 14 which tension will be transmitted to the transom 2 by the casing side wall 6, 7. As the skier veers to either side of the boat relative to its longitudinal direction of travel, the rope will engage one or the other of side walls 6, 7. The arm 30 will pivot freely about its universal pivot pins 28, 34 and no tension will be transmitted to the arm. The tension in the tow rope due to the weight of the skier being towed will assist in clamping the housing 1 to the transom 3.

When the skier drops the rope at the end of a ride or due to a fall, the boat operator closes switch 46 whereby the electrical circuit of the motor 16 is closed. Motor 16 will drive reel 14 to reel in the tow rope 15. It is important to note that the rope may be reeled in automatically without the attention of the boat operator when the boat is either in motion or at rest. When the rope is reeled in to the point that float 37 engages eyelet 31, further reeling in of the rope will pivot arm 31 upwardly to the position of FIG. 1. The arm, which is light weight and formed from a suitable magnetic material—such as stainless steel for example—engages switch operating bar 40 to pivot the same toward rear wall 10. Connecting rod 43 is then moved to the left to open the contacts of switch 44 and discontinue operation of the reel driving motor 16. The arm will simultaneously engage magnetic latch 48 (or 49 as the case may be) so that the arm will be held by magnetic attraction in the upper position of FIG. 1. Of course, other types of latches—such as a friction latch for example—might be substituted for the illustrated magnetic latch. Due to the angle at which bracket 23 has been set relative to the vertical axis of rear wall 10 by bolt means 25, arm 30 will angularly extend to the side of the boat so that the tow rope handle 39 will hang downwardly adjacent the side of the boat above the waterline as shown in FIG. 1. Thus a person swimming in the water may readily grasp the tow rope handle without fear of the propeller of the outboard motor 4. Also the handle 39 is positioned for ready grasping by a prospective skier on a pier or float.

When it is desired to unreel the tow rope with the apparatus in the position of FIG. 1 (switch 46 having been opened by the boat operator), the prospective skier grasps the tow rope handle 39 and pulls downwardly or rearwardly with a force to overcome the force of magnetic attraction of the permanent magnet latch 48 (or latch 49). Arm 30 is then lowered to its normally horizontal position of FIGS. 2 and 3 and the tow rope may be freely unreeled as the boat moves slowly away from the skier. When the rope is completely unreeled and the skier indicates all to be in readiness, the boat operator opens the throttle to full power to pull the skier out of the water.

Although the invention has been described with reference to a water-skiing tow rope, it is, of course, obvious that the invention is also applicable for other reeling devices, such as anchor chain reels, for example. It is also to be understood that while the device has been illustrated as being clamped to the transom of an outboard motor boat, it may also be adapted for securement to other places on inboard or outboard boats.

Also, instead of having section 33 of arm 30 pivotally connected to section 32 by pivot pin 34 as shown in FIG. 5, I also contemplate a further modification having the cylindrical end portion of section 33 held against a peripheral flange on the outer surface of section 32 solely by the biasing action of the spring 36. In this case the end of spring 36 adjacent pin 28 terminates at the end of section 33 and is connected to hinge pin 28 by a connecting link. This connecting link permits the spring end to move to either side of section 32 in the direction that section 33 is moved, so that unequal stretching of the spring and breaking down of its tensile strength is avoided.

This modification of the structure shown in FIG. 5 is illustrated in FIGURE 9, in which the peripheral flange is shown at 32*b* and the connecting link is shown at 36*a*.

While in accordance with the patent statutes I have illustrated and described the best forms and embodiments of my invention now known to me, it will be apparent to those skilled in the art that other changes may be made in the apparatus described without deviating from the scope of my invention as set forth in the following claims.

I claim:

1. A reeling device comprising a casing having spaced side walls and a rear wall, a reel rotatably mounted between said side walls, a normally-horizontal guide arm connected at one end to said rear wall for pivotal movement about a generally horizontal pivot axis, said guide arm extending generally longitudinally rearwardly from said casing and having an eyelet at the other end thereof, a tow rope connected at one end to said reel and extending through the eyelet in said guide arm, said tow rope having a body secured thereto adjacent the free end thereof which is larger than the size of the opening of said eyelet, electric motor means for driving said reel to wind the tow rope thereon and to pivot said guide arm upwardly to a substantially vertical position when said body contacts said eyelet during the winding operation, and switch means operable by said arm when said arm is raised to

its substantially vertical position for de-energizing said electric motor means to interrupt the operation thereof.

2. A water-skiing tow rope reeling device comprising a casing including a rear wall, a reel rotatably mounted in said casing, a normally-horizontal guide arm, universal joint means pivotally connecting one end of said guide arm to the exterior surface of said rear wall, said guide arm extending generally longitudinally rearwardly of said casing and having an eyelet at the other end thereof, a tow rope connected at one end to said reel and extending through the eyelet in said guide arm, said tow rope having a body secured thereto adjacent the free end thereof which is larger than the size of the opening of said eyelet, electric motor means for driving said reel to wind the tow rope thereon and to pivot said guide arm upwardly to a substantially vertical position when said body contacts said eyelet during the winding operation, switch means on said casing operable by said arm when said arm is raised to its substantially vertical position for de-energizing said electric motor means to interrupt the operation thereof, and latch means on said casing for removably maintaining said arm in its substantially vertical position.

3. A water-skiing tow rope reeling device comprising a casing having a rear wall, a reel rotatably connected to said casing for rotation about a horizontal axis, a guide arm pivotally connected at one end to said rear wall and extending longitudinally rearwardly from said casing, said guide arm having guide means including an aperture at the other end thereof, a tow rope connected at one end to said reel and extending through the aperture of said guide means, said tow rope having a body secured thereto adjacent the free end thereof which is larger than the size of the aperture of said guide means, electric motor means driving said reel to wind the tow rope thereon, said guide arm being pivotally connected to said rear wall at an elevation which is lower than the peripheral point at which said tow rope is wound on said reel, and switch means on said casing operable by said guide arm when said guide arm is pivoted upwardly about its pivot axis as a result of the engagement of said body with said guide means to interrupt the operation of said electric motor.

References Cited in the file of this patent

UNITED STATES PATENTS

1,153,887	Blair	Sept. 21, 1915
2,437,630	Williams et al.	Mar. 9, 1953
2,664,250	Friedman	Dec. 29, 1953
2,816,310	Nale	Dec. 17, 1957

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,029,041 April 10, 1962

Wright Child

It is hereby certified that error appears in the aboye numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 61, after "arm" insert -- pivotally --.

Signed and sealed this 24th day of July 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents