July 20, 1965 R. D. SHRINER ETAL 3,195,831

MEANS FOR RETRIEVING AND STORING WATER SKI ROPES

Filed June 1, 1962 2 Sheets-Sheet 1

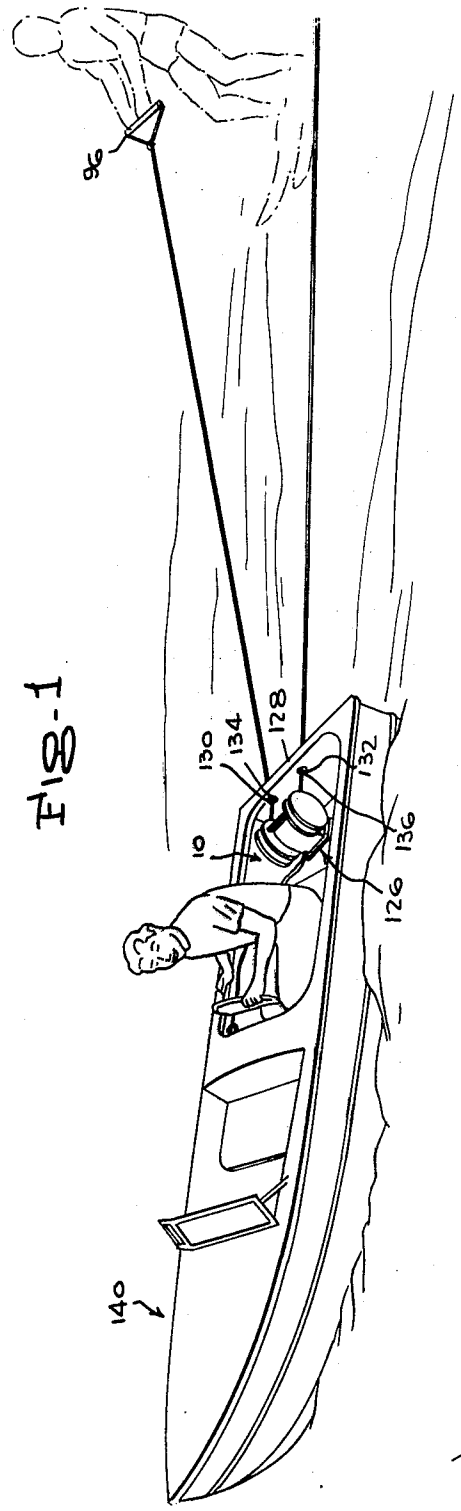


FIG-1

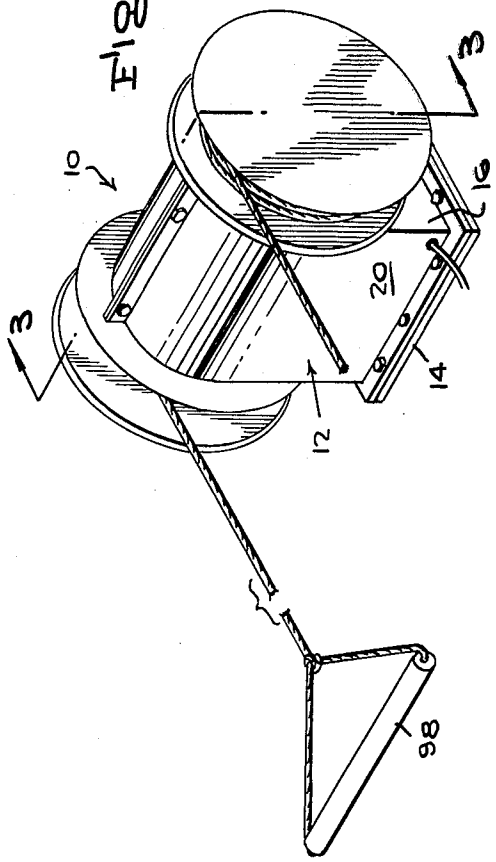


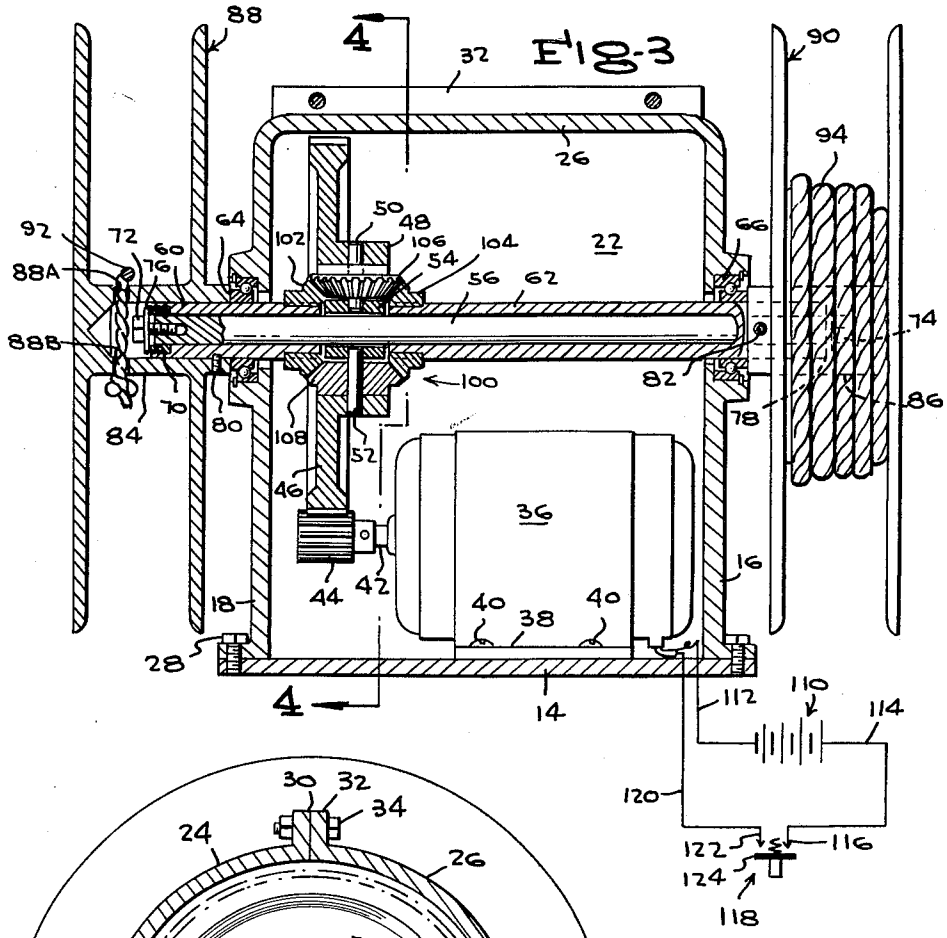
FIG-2

INVENTORS
ROBERT D. SHRINER, &
HAROLD C. VOSS
BY
McMorrow, Berman + Davidson
ATTORNEYS

July 20, 1965 R. D. SHRINER ETAL 3,195,831

MEANS FOR RETRIEVING AND STORING WATER SKI ROPES

Filed June 1, 1962 2 Sheets-Sheet 2



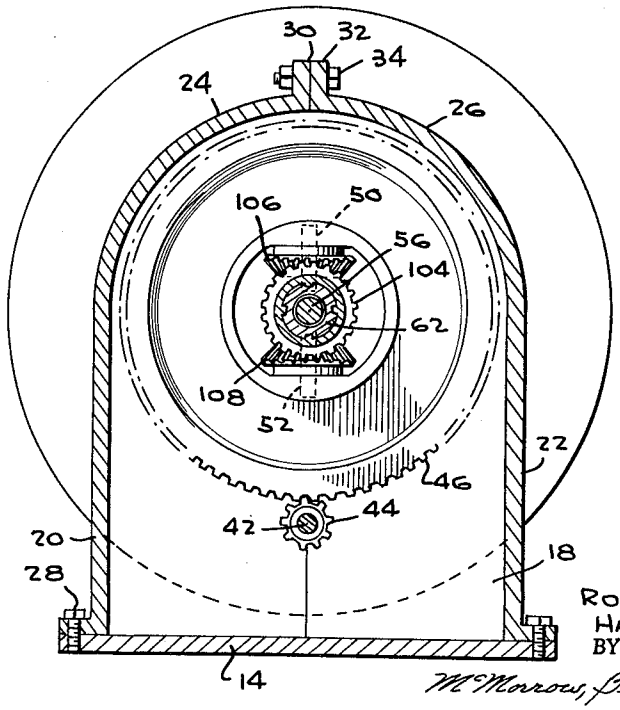


Fig-4

INVENTORS
ROBERT D. SHRINER,
HAROLD C. VOSS
BY
McMorrow, Berman & Davidson
ATTORNEYS

United States Patent Office 3,195,831 Patented July 20, 1965

3,195,831
MEANS FOR RETRIEVING AND STORING WATER SKI ROPES

Robert D. Shriner, 1740 E. 14th St., and Harold C. Voss, 1312 E. 1st St., both of Pueblo, Colo.

Filed June 1, 1962, Ser. No. 199,462
4 Claims. (Cl. 242—86.5)

This invention relates to retrieving means and, more specifically, the instant invention is directed to the provision of means for retrieving water ski towing ropes.

One of the primary objects of this invention is to provide a means or device for retrieving and storing water ski ropes to prevent propeller fouling and potential threats of physical injury to water skiers being towed from a single power boat.

A further object of this invention is to provide a device for retrieving and storing water ski ropes simultaneously, or independently, one from the other.

Another object of this invention is to provide a water ski tow rope retrieving and storing device wherein means are provided to permit the tow ropes to be easily payed out from the towing vessel.

This invention contemplates, as a further object thereof, the provision of means or a device of the type generally referred to supra, the means or device being non-complex in construction and assembly, inexpensive to manufacture, and durable in use.

Other and further objects and advantages of the instant invention will become more evident from a consideration of the following specification when read in conjunction with the annexed drawings, in which:

FIGURE 1 is a perspective view of a powered motorboat showing the installation of a means or device for retrieving and storing a plurality of water ski towing ropes thereon;

FIGURE 2 is an enlarged perspective view of the means or device for retrieving and storing water ski ropes constructed in accordance with this invention;

FIGURE 3 is an enlarged medial detail cross-sectional view of the water ski towing rope retrieving and storing device, FIGURE 3 being taken substantially on the vertical plane of line 3—3 of FIGURE 2, looking in the direction of the arrows; and

FIGURE 4 is a transverse detail cross-sectional view, FIGURE 4 being taken substantially on the line 4—4 of FIGURE 3, looking in the direction of the arrows.

Referring now more specifically to the drawings, reference numeral 10 designates, in general, a means or device for retrieving and storing water ski ropes constructed in accordance with the teachings of this invention. As will be made more manifest below, means are provided for retrieving and storing a plurality of water ski tow ropes simultaneously, or independently, one from another. The device 10 includes a differential housing 12 supported on an elongated substantially rectangular base plate 14. The housing 12, for convenience of assembly, and to facilitate repairs and maintenance, is split longitudinally and medially to provide an identical pair of opposed half sections. When assembled, as shown herein, the housing sections give rise to a pair of oppositely-disposed end walls 16, 18, a pair of oppositely-disposed downwardly and outwardly-diverging sidewalls 20, 22, which terminate at their respective upper ends in arcuately-shaped top walls 24, 26. The lower ends of the end walls 16, 18 and sidewalls 20, 22 have a peripheral flange projecting laterally and outwardly therefrom and receive bolts 28 therethrough which are threaded into the base plate 14. The upper ends of the top walls 24, 26 are integrally formed with longitudinally-extending flanges 30, 32 disposed in confronting relation and are clamped or otherwise releasably connected together as by bolts 34.

Reference numeral 36 denotes an electric motor having opposed mounting flanges 38 (only one being shown) secured to the base plate 14 by screws 40. The motor 36 includes a conventional drive shaft 42 on which is fixedly secured a spur gear 44. As is seen in the drawings, the axis of the spur gear 44 and of the drive shaft 42 is perpendicular to the end wall 18 and is disposed proximate thereto.

The spur gear 44 meshes with a ring gear 46 having a laterally-projecting hub 48. The hub 48 carries a pair of diametrically-opposed shafts 50, 52, the inner ends of the latter being secured in a bushing 54 mounted for rotation about a shaft 56. The opposed ends of the shaft 56 have telescoped thereover a pair of sleeves 60, 62 suitably journaled for rotation in bearings 64, 66 disposed in the end walls 18, 16, respectively. The shaft 56 and sleeves 60, 62 project beyond the remote sides of the end walls 18, 16. The remotely-disposed ends of the sleeves 60, 62 are counterbored to receive thrust bearings 70 (only one being shown), and the end-play of the sleeves is held in adjustment by means of lock screws and washers 72, 74 and 76, 78, respectively.

Fixedly secured on the remotely-disposed ends of the sleeves 60, 62 by means of set screws 80, 82, are, respectively, the hubs 84, 86 of a pair of reels 88, 90. Each hub 84, 86 is provided with a pair of diametrically-opposed openings 88A, 88B (only one pair being shown in FIGURE 3) through which is threaded and secured one end of a pair of water ski tow ropes 92, 94. The other ends of the ropes 92, 94 connect with water ski towing handles 96, 98.

Reference numeral 100 designates, in general, differential gearing disposed within the housing 12. The differential 100 includes a pair of beveled gears 102, 104 which are keyed, respectively, to the adjacent ends of the sleeves 60, 62. Interposed between and meshing with the gears 102, 104 is a pair of oppositely-disposed bevel gears 106, 108 mounted on the shafts 50, 52.

Any conventional source of E.M.F., may be utilized to energize the motor 36 such as, for example, a battery 110. One side of the battery 110 connects with one side of the motor 36 through wire 112, and the other side of the battery connects through wire 114 with the fixed switch contact 116 of a conventional switch 118. A wire 120 connects with the other side of the motor 36 and with a second fixed switch contact 122. The two fixed switch contacts are engageable with and/or are spanned by a switch arm 124 to complete a series circuit to the motor 36.

It will be understood, of course, that any electrical power source may be utilized to drive the motor 36 and/or that means other than the electric motor 36 could be employed for the purpose of driving the gear 46.

The device 10 may be secured to a seat, the hull 126, or other supporting means in any desirable manner which will position the same adjacent the transom 128. The transom 128 is bored at 130, 132 adjacent the upper end thereof to receive the ski tow ropes 92, 94 therethrough. The diameter of the bores 130, 132 is just great enough to permit the ropes to pass smoothly therethrough in either direction, and the ropes are knotted at a desired interval intermediate their ends, as at 134, 136, to abut against the inner side of the transom 128, thereby limiting the length of the tow and to place the strain of the water skier directly thereon.

To utilize this invention, let it be assumed that the water ski tow ropes 92, 94 have been payed out in the manner illustrated in FIGURE 1, and that two water skiers are being towed by the boat 140. This places a load on both reels 88, 90. The gears 102, 104 are locked with the gears 106, 108 so that if the switch 118 is closed, the turning of the gear 44 on the drive shaft 42 will cause

the gear 46 to rotate and simultaneously turn the sleeves 60, 62 in the same direction to rotate the reels 88, 90 in such a direction as to retrieve the ski tow ropes 92, 94.

When the tow ropes have been retrieved, the power boat operator merely releases the switch 118 which is spring-biased to its open position, whereby the motor 36 is de-energized.

Again, let it be assumed that both of the ski tow ropes 92, 94 have been extended to the position shown in FIGURE 1, and that the boat 140 is towing a pair of water skiers. Let it further be assumed that one of the two skiers deliberately lets loose of one of the handles 96 or accidentally and inadvertently disconnects himself therefrom. Let it further be assumed that the skier who is disconnected from the handle 96 was connected with the tow rope 92. Under these conditions, the power boat operator again closes the switch 118 to cause the motor 36 to become energized and to again drive the gear 44. The gear 44 again drives the gear 46, but in this instance, since there is no load on the tow rope 92 and a load on the tow rope 94, the gears 106, 108 will walk around the gear 104 while effecting rotation of the gear 102 which drives the sleeve 60 carrying the reel 88 on which is trained the tow rope 92. In the event the skier connected to the tow rope 94 became disconnected therefrom while the skier on the tow rope 92 remained connected therewith, the operator of the boat 140 closes the switch 118, causing the gear 44 to rotate and drive the gear 46. In this instance, the gears 106, 108 walk around the gear 102 and drive the gear 104, causing the sleeve 62 and the pulley 90 to rotate and reel in the tow rope 94. In the event both skiers became disconnected from their respective lines 92, 94, the closing of the switch 118 will cause both pulleys to rotate, thus, retrieving the tow ropes.

To extend the tow ropes 92, 94 it is only necessary for the user to exert a slight pull on the other ends thereof which will, of course, cause the gear 46 to rotate and manually drive the motor 36 through the gear 44.

Having described and illustrated one embodiment of this invention in detail, it will be understood that the same is offered merely by way of example, and that this invention is to be limited only by the scope of the appended claims.

What is claimed is:

1. A water ski tow rope retrieving device comprising a differential housing for mounting in a boat and including a pair of oppositely-disposed and spaced end walls, a shaft supported on and extending between and beyond the remotely-disposed sides of said end walls, a pair of sleeves telescoped over said shaft and rotatable relative thereto, said sleeves having their respective remotely-disposed ends extending beyond the remotely-disposed sides of said end walls, a reel to receive said tow rope fixedly secured to each remotely-disposed ends of said sleeves, the adjacent inner ends of said sleeves being axially spaced from one another, a bevel gear connected to each of said inner ends of said sleeves, a driven gear surrounding said shaft and carrying a pair of diametrically-opposed bevel gears meshing with said first-named bevel gears, and means for driving said driven gear.

2. A water ski tow rope retrieving device (10) to be fixedly mounted in a boat having a transom through which a plurality of tow ropes are passed for reciprocation therethrough and comprising,

(a) a substantially hollow differential housing (12);

(b) said differential housing including a pair of oppositely-disposed substantially parallel end walls (16, 18);

(c) a shaft (56) extending between and projecting beyond the remotely-disposed sides of said end walls (16, 18);

(d) a pair of sleeves (60, 62) with one telescoped over each end of said shaft (56) and having their respective adjacent ends disposed in axially-spaced relation relative to said shaft (56);

(e) means (64, 66) supporting said sleeves (60, 62) for rotation in said end walls (16, 18);

(f) a bevel gear (102, 104) fixedly secured to each of said adjacent ends of said sleeves (60, 62);

(g) a spur gear (46) mounted for rotation about said shaft (56);

(h) a pair of bevel gears (106, 108) mounted on said spur gear (46) in diametrically-opposed relation and meshing with said first-named bevel gears (102, 104);

(i) said sleeves (60, 62) having remotely-disposed ends projecting beyond said end walls (16, 18) and each remotely-disposed end of said sleeves having a tow rope retrieving reel (88, 90) fixedly secured thereto for rotation therewith;

(j) means (88A, 88B) on each of said reels (88, 90) for connecting one end of a water ski tow rope (92, 94) thereto;

(k) and means (36, 46, 110, 112, 114, 116, 120, 122 and 124) for driving said spur gear (46).

3. A water ski tow rope retrieving device as defined in claim 2, wherein said last-named means (k) includes:

(l) an electric motor (36) having

(m) a drive shaft (42) on which is mounted

(n) a gear (44) meshing with said spur gear (46), and

(o) an electric circuit selectively operable for energizing said motor (36).

4. A water ski tow rope retrieving device as defined in claim 3, and

(p) means (126) for securing said device within a boat (140).

References Cited by the Examiner

UNITED STATES PATENTS

854,052	5/07	Mollier	226—188 X
1,248,186	11/17	Smith.	
3,027,116	3/62	Holloway	242—86.5

FOREIGN PATENTS

703,883	2/31	France.

MERVIN STEIN, *Primary Examiner.*

JOSEPH P. STRIZAK, *Examiner.*