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COMPLETE SPECIFICATION

Far-casting Reel with Automatic Paying-out of the Line for use in Fisheries

I, ALBERT GLASER, of Malvenstrasse 15, Zürich-Oerlikon, Switzerland, a Swiss Citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to casting reels for use in connection with fishing rods such rods being of the kind having a stationary spool and a line guide which is rotatable around the stationary spool by a driving medium to wind the line onto the spool.

The object of the present invention is to effect certain improvements in casting reels of this kind, the principal improvement consisting in providing a driving connection between the line guide and its driving medium such that the line guide can reverse its direction of rotation against the action of the driving medium when an excessive pull is given to the line.

In the preferred arrangement a friction drive is provided between the line guide and its driving medium which is adapted to slip under an excessive pull and in order that the invention may be clearly understood and carried into effect such a construction of reel will now be described, by way of example, by aid of the accompanying drawings in which:—

Fig. 1 shows the far casting reel in section.

Fig. 2 shows the special manner of fixing the driving lever.

Fig. 3 indicates the manner of fixing the line reel on its axle and the special manner of construction of the line guide.

Fig. 4 is a view similar to Fig. 1 but illustrating a modification hereafter to be described.

The three fixed bearings 1, 2, 3, are arranged in a common housing, not shown here, the bottom of which forms the basis for fixing to the fisherman's rod. The driving force is transmitted to the pinion

5 via the toothed wheel 4 by means of the crank 17. The pinion 5 and the disc 6 connected thereto rotate in the bearing 1, as soon as the crank 17 is turned. The line guiding drum 9 is pressed against the disc 6 through the spring 8. The pressure of the spring and the friction torsional moment produced thereby, with which the line guiding drum 9 and the line guide 10 connected thereto is carried along, can be altered by adjusting the nut 7. If the torsional moment adjusted on the friction links 6 and 9 is greater than the torsional moment resulting on the line guide 10 and dependant on the tractive force on the line 14, the line guiding drum 9 is carried along by the rotating disc 6, and thus the line guide 10 revolves around the line reel 13. In order to wind up the line 14 on the line reel 13, the crank 17 must be driven in that direction of rotation, which allows the line guide 10 to revolve around the line reel 13 in the direction indicated by the arrows in Fig. 3. The casting reel is fixed to a fisherman's rod in such a manner that the axle 12 lies in the direction of the rod, along which the line slides through a few guiding rings fixed on the rod. The line reel 13 is clamped with the eccentric bolt 11 to the non-rotating axle 12 so that it cannot move in any direction. The axle 12 is ensured against turning by means of the pin 15 and describes oscillating movements in the slide guide 16 when the drive is operated. The mechanism for the oscillating movement of the axle 12 is not illustrated for the sake of simplicity. The driving crank 17 is removable and is closely connected, likewise on all sides, to the driving shaft 20 by means of the conical nut 18.

The functions of the far casting reel in the various phases of the fishing process, are as follows:—

The bait is thrown out by means of the fisherman's rod; the condition shown in Fig. 1 corresponds to the moment at which

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the bait is hauled in again by winding up the line; the line guide 10 revolves around the line reel 13 in the direction shown by the arrow. However this is only possible when upon hauling in the bait which has not been taken, the torsional moment acting on the line guide 10 is considerably smaller than the friction torsional moment adjusted on the friction drive 6/9 for capturing a fish. Since the line guide 10 through revolving around the line reel 13 puts the line on to the latter, and since the part of the line running out from the line guide 10 over the fisherman's rod lies almost vertically to the plane of the reel, the line undergoes a twisting at each rotation of the line guide 10 around the line reel 13. After each cast and the subsequent winding up of the line, new twistings would be added to the already existing twistings of the line, which in a short time would lead to so-called formation of coils if this disadvantage were not overcome by the special method of paying out of the line. This is done in the following manner: Before the cast, the line 14 is taken out of the line guide 10 and is released at the suitable moment, whereby it then rotates sliding spirally over the edge of the reel around the line reel 13 counter to the winding-up direction, and rolls off in the direction of the line reel axle. In casting the exactly opposite process takes place as in the winding-up of the line; thereby the twistings produced through the winding up of the line are again eliminated.

The automatic paying out of the line comes into effect as soon as a fish has taken up the bait thrown out and tries to escape. An automatic paying out of the line can only be considered if it takes place at the critical moment when a fish takes the bait or tries to escape, that is, when the driving medium revolves and also when it is held fast. According to the ratios of force between the friction drive 6 to 9 and the escaping fish, the line is wound off or wound up. If the fish approaches the fisherman's station, the fisherman will wind up the line, in order to keep in continuous contact with the fish, but if the fish escapes away from the fisherman, he then endeavours, by holding or turning the driving medium, to oppose a resisting force to the fish. This resisting force is limited however, in order to avoid breakage of the line, by adjusting the friction drive 6 to 9 below the breaking load. Therefore if the strain of the fish increases so much that it overcomes the friction torsional moment set in pulling off the line then the line guide 10 reverses the direction of rotation which it had assumed in the winding up. With the

automatic paying out of the line the line 14 running out, remains in the line guide 10, which is drawn back—and the line with it—counter to the direction of the arrows through the force resulting from two components: one of which being the line running off on the circumference of the line reel, the other the same line running out over the line guide 10. In this manner also in this phase of the fish catching the twistings caused upon the winding-up of the line are again eliminated. If the fish remains stationary in spite of turning the driving crank 17, the line is neither run off nor hauled in, the line guide 10 remaining in the process likewise stationary and the disc 6 sliding on the line guiding drum 9. If the escaping fish draws off the line when the driving medium is turned at the same time, then the disc 6 and the line guiding drum 9 slide on each other in the opposite direction, whereby the line guide 10 rotates opposite to the direction of the arrow. Just on account of the frequent repetition of this process, the so-called "Drill" of the fish, at each hauling in of the fish the twistings occasioned by the winding-up of the line would become cumulative, and after a short time would lead to the formation of coils; this is frustrated through the property of the line guide which reverses upon the automatic paying out of the line. In this, the far casting reel according to the present invention differs from the known far casting reels in which the line guide is in solid connection with the driving medium, whilst the line reel is connected with its support via a friction link, so that it can rotate. In this arrangement the automatic paying out of the line is accomplished, the line is run off over the line guide which is fixed, or it rotates in the direction of the winding-up, whereby the line reel rotates. This running off of the line does not go round the reel and does not eliminate the twistings occurring upon winding-up, from which the disadvantage mentioned at the beginning results.

According to the present invention the friction link lies between the line guide and the gear, however the same result could be obtained if it were arranged between the line guide and any link transmitting the driving force.

As can be seen from Figs. 1 and 2, the driving crank 17 is made so that it can be dismantled for eliminating deformation and for saving space. The support 19 connected to the driving shaft is provided with a U-shaped recess, into which fits the slit end of the driving crank 17. The point 21 of the driving crank through which passes the driving shaft 20 is 130

conically sunk. By screwing in the conical nut 18 into the recess 21 the lever halves formed through the slit are laterally pressed in the U-shaped recess and at the same time in the direction of the driving shaft. In this way the driving crank 17 is secured both radially and also axially and against longitudinal displacement and is connected to the driving shaft without any dead clearance. For removing the driving crank it is sufficient to turn back the conical nut 18, without its having to be screwed off the driving shaft. Then the crank can be withdrawn via the slit which is enlarged for that purpose at the end of the crank.

A special characteristic of the form of execution shown relates to the fixing of the line reel and its ready interchangeability. Fig. 1 shows the eccentric bolt 11 in rotatable connection with the line reel 13 and Fig. 3 shows the engagement of the eccentric bolt in the axle 12. The position shown of the eccentric bolt is obtained through turning it slightly, until the eccentric edge has become solidly wedged at the bottom of the recess of the axle 12. In this phase the line reel is fixed to the axle in an axial and radial direction. For removing the line reel 13 the eccentric bolt is again turned back, until its edge recess is opposite to the axle, after which the line reel can be drawn off without the fixing medium needing to be removed.

The line slides over the line guide 10 shown in Fig. 1 and 3 upon the bait being hauled in or upon the automatic paying out of the line. In contradistinction to the known arrangements this line conductor is constructed as a rotating reel, in order to prevent a rapid wear and tear of the line. Baked steatite has proved to be a particularly suitable material, which besides its hardness and freedom from rust, has the further advantage of absorbing oil. The latter property gives a permanent sliding facility together with minimum wear and tear.

The winding characteristic is of great importance *inter alia* for far casting. It is important that the line, especially at the start of the casting, should glide over the edge of the reel with as little friction as possible. This is obtained when the line 14, as is shown in the drawing, is so wound up, that it easily rises up to the back edge of the reel. The character of the winding of the embodiment of Fig. 1, is determined by a control disc 25; according to a definite law this moves the shaft 12 to and fro and with it the line reel 13, by means of the pin 15, whilst the line guide 10 revolves around the line reel.

However the character of the winding is not only determined by the shape of the control disc 25, but also is dependent on the position of the line reel 13 with respect to the line guide 10. Slight changes of position, brought about through the medium of the unavoidable mechanical wear and tear, alter the character of the winding in such a manner, that the advantage obtained is entirely removed again.

The use of different thicknesses of line has the same result, since it alters the rising winding of the line guide to the line reel which is equivalent to a change of position of the line reel or line guide.

To provide for this I can arrange for at least one of the parts determining the reciprocal position of the line coil to the line guide to be made adjustable. One such arrangement is illustrated in Fig. 4. In this arrangement a threaded sleeve 22 is screwed into the line reel 13, which can be fixed by means of the nut 23 in the body of the line reel. The line reel with its threaded sleeve thus fixed is turned on the threaded pin 24 up to the break of the shaft 12. If the threaded sleeve 22 is now axially displaced through turning to the left or to the right, the position of the line reel also changes with respect to the line guide 10, wherewith the character of the winding is altered.

For the same purpose the pin 15 could also be arranged so as to be axially displaced. Also the shaft 12 could be changed in its length by means of an adjusting device and could thus move the line reel axially. Instead of the line reel, the line guide 10 could be made movable or the line guide drum 9 with respect to its support.

The direction of the thread of the threaded pin 24 is so selected, that the line reel 13 by pulling the line 14 is drawn tight on to the break in the shaft. Since upon the bait being thrown out a strong pull acts on the line 14, the line reel automatically becomes fixed, an advantage which renders unnecessary any removable fixing medium or fixing tool when the reel is interchanged.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A casting reel having a stationary spool and a line guide which is rotatable around the stationary spool by a driving medium to wind the line onto the spool in which the driving connection between the line guide and its driving medium is such that the line guide can reverse its direction of rotation against the action of the driving medium when an excessive

pull is given to the line.

2. A casting reel as in claim 1 having a friction drive between the line guide and its driving medium which is adapted to slip
5 under an excessive pull.

3. A casting reel according to claim 2 in which the friction drive comprises a disc carried by and driven with the driving
10 medium, the line drum being held in frictional engagement with the disc by means of a spring or the like.

4. A casting reel according to claims 2 or 3 in which the frictional engagement between the line drum, and the disc is
15 variable for the purpose specified.

5. A casting reel according to any of the preceding claims in which the driving medium is operated by a crank, the crank being in the form of a split lever, the
20 connection between the driving shaft and crank being effected by expanding the crank into a recess formed on the driving shaft, by means of a coned nut.

6. A casting reel according to any of
25 the preceding claims wherein the line reel

is held stationary by clamping to a stationary axle by means of an eccentric bolt carried by the line reel, tightening of such bolt serving to wedge the same in a groove provided in the axle, and loosening the
30 bolt effecting release of the line reel to permit the same to be removed for any particular purpose.

7. A casting reel according to any of the preceding claims wherein the line reel is
35 adapted to reciprocate to position the line as it is wound on or off the spool.

8. A casting reel according to claim 7 in which one or more parts of the reciprocating mechanism are made adjustable to
40 compensate for mechanical wear.

9. A casting reel substantially as herein described with reference to either example illustrated.

Dated this 16th day of March, 1937.

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For the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]

