Oct. 29, 1963 E. FRODE 3,108,761

CLOSED FACE REEL

Filed Oct. 25, 1960 4 Sheets-Sheet 1

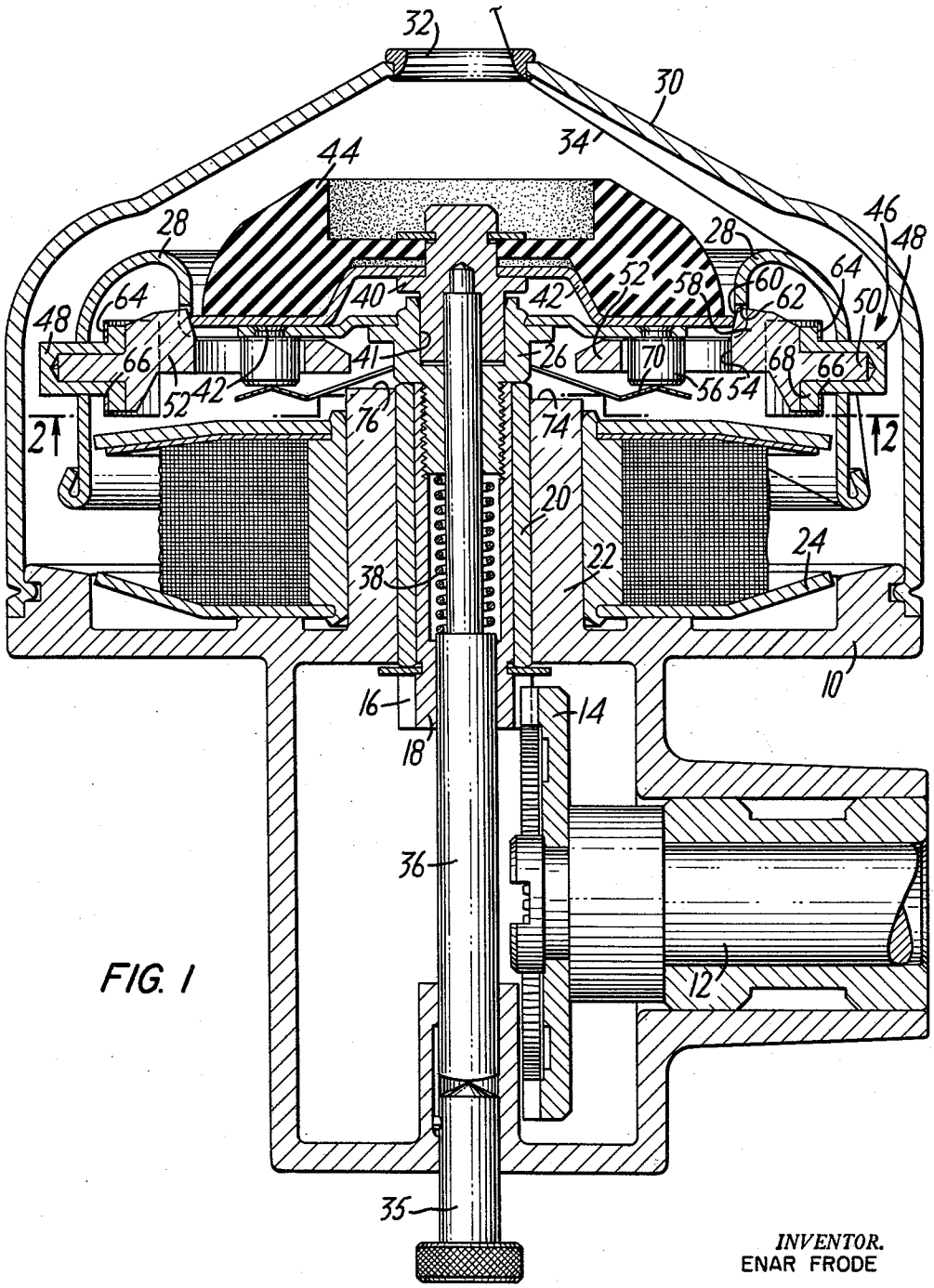



FIG. 1

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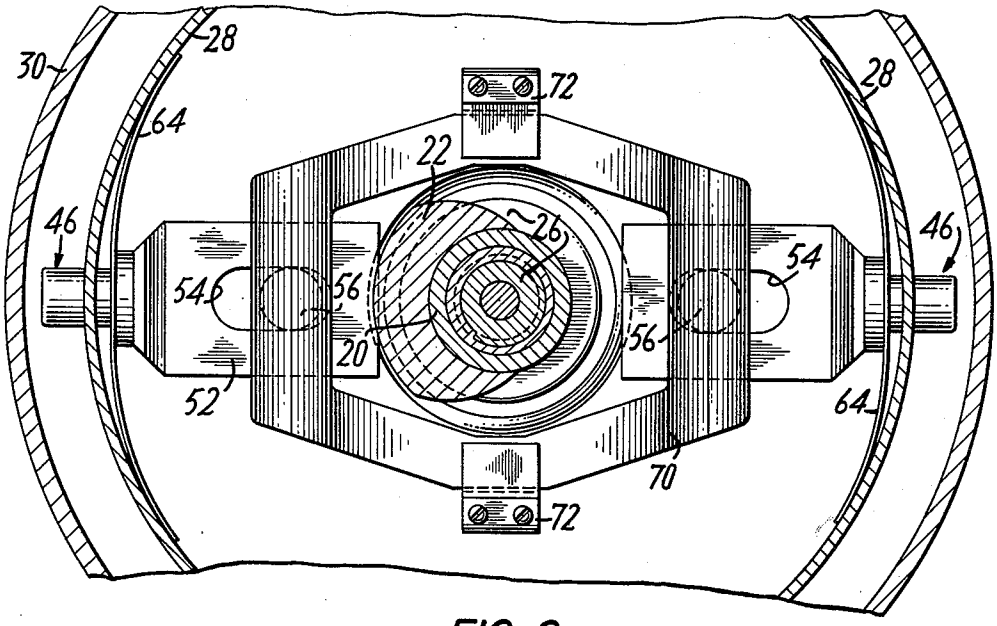



FIG. 2

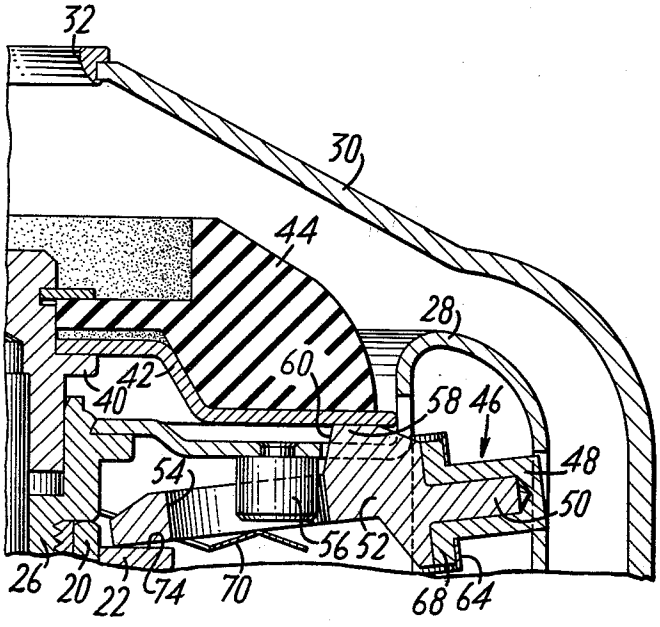



FIG. 3

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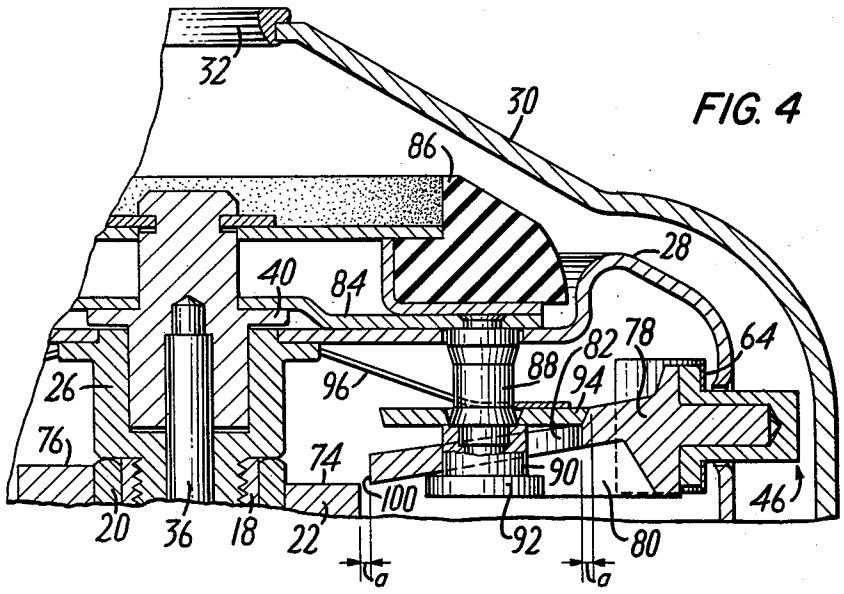



FIG. 4

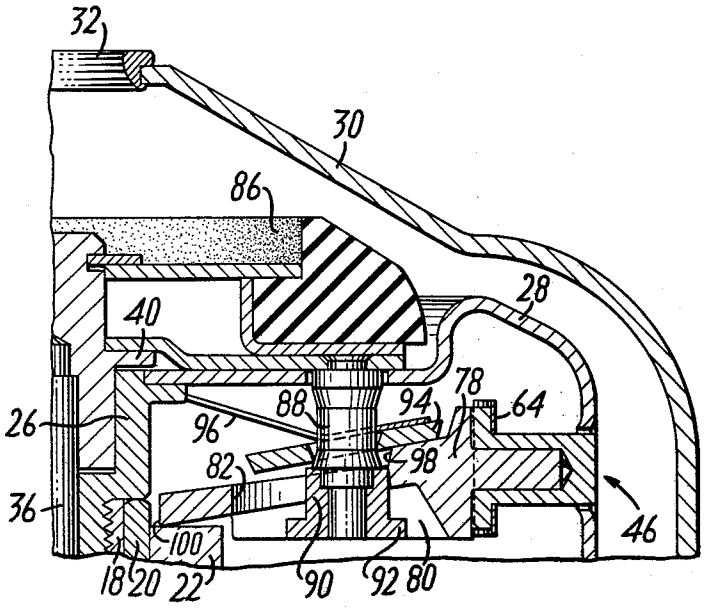



FIG. 5

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FIG. 6

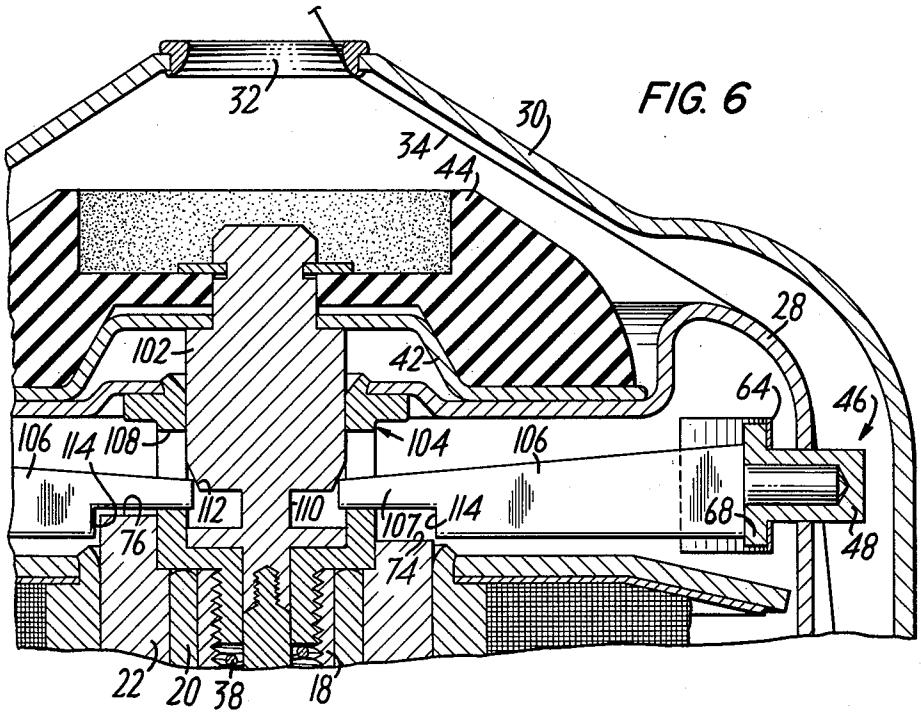
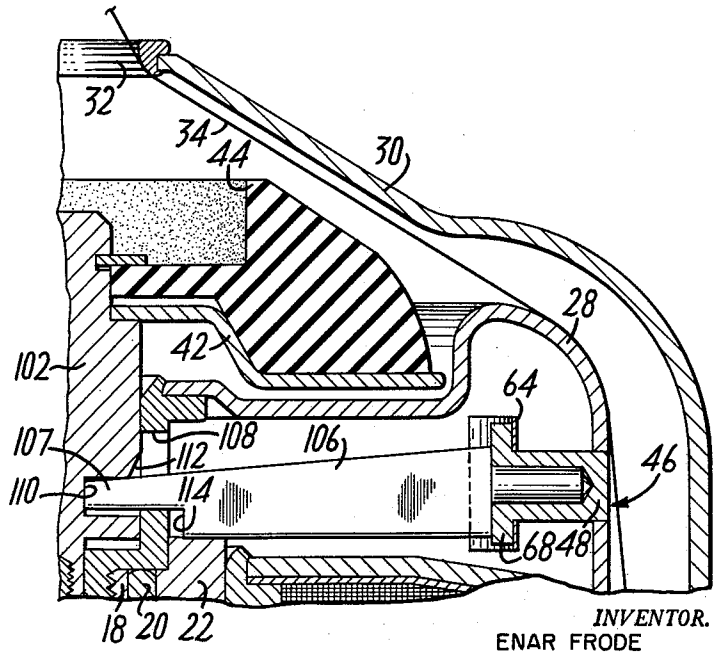



FIG. 7




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United States Patent Office 3,108,761 Patented Oct. 29, 1963



3,108,761

# CLOSED FACE REEL

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Claims priority, application Sweden Nov. 4, 1959
10 Claims. (Cl. 242—84.2)

This invention relates to fishing reels, more particularly to fishing reels known as the spinning type.

In reels of this type the line is wound about the rotationally stationary spool and is cast off the end of the spool. Spools in such reels are sometimes axially reciprocated and may even have rotational movement as for drag. However, for the purposes of understanding this invention, such motions on the spool are immaterial although they may, if desired, be coupled with the advantages of this invention. Accordingly, when the phase "fixed or stationary spool" is employed hereinafter it will be understood the spool need not be absolutely fixed or stationary but only relatively rotationally stationary for rewinding purposes.

The present invention relates primarily to improvements in the spinning or winding member and its associated operative structures.

In reels of this type a radially extensible winding pin is associated with the winding member. Frictional engagement with the line results in wear on one side of the pin and on the winding member adjacent the pin. Accordingly, it is an object of this invention to provide a simplified structure that by its nature is adaptable to operating a plurality of such pins by a single means. It is an object of the invention to thereby distribute the wear on the winding member.

It is a further object of the invention to design a novel construction for the pin itself so that it may comprise a replaceable and rotatable cap so that wear may be distributed about its circumference upon random rotation.

In reels of this type heretofore known the pin is spring-loaded inwardly and is extended either by a rotating cam having a driving step or by a central stationary cam. The former presents certain problems in that there must be some inertia or drag on the winding member to enable the pin to climb the cam for extension. The latter type creates an additional drag on the winding member since the pin must be in constant moving contact with an outer periphery of constant radius. It is accordingly an object of the invention to overcome such difficulties and provide a means for extending the pin and maintaining it in its extended position without any frictional drag whatsoever.

It is a further object of the invention to provide a reel of the type described, having a stationary cam for operating the pin and means to maintain the pin in extended position without creating friction on the motion of the winding member.

It is a further object of the invention to provide a novel means for supporting the pin in extended position and for releasing it therefrom.

It is a further object of the invention to provide a winding reel of this type providing positive action for moving the pin about the cam to extend the pin, and then removing the pin from frictional contact with any non-rotating member.

It is another object to provide a simplified line snubbing means and a simplified means for releasing the extended pin.

In the accompanying drawings:

FIG. 1 is an axial section of a spinning reel constructed in accordance with the invention and showing certain of the shafts in full;

FIG. 2 is a transverse section taken along the line 2—2 of FIG. 1;



FIG. 3 shows part of the section similar to that shown in FIG. 1 with certain members in a different operating position;

FIGS. 4 and 5 are similar sections showing a modification of the invention; and

FIGS. 6 and 7 are similar partial sections showing a further embodiment of the invention.

Referring now to FIG. 1, a support 10 comprises in its lower portion a drive means consisting of a shaft 12 rotated by a crank (not shown). Shaft 12 carries a gear wheel 14 meshing with and driving a gear 16 formed on a hollow shaft 18. Shaft 18 extends upwardly through a bushing 20 in a hub 22 integral with support 10. The hub 22 constitutes the centering journal for line spool 24. The line spool 24 is non-rotary as herein disclosed. It may, if desired, be mounted for drag rotation either adjustable or non-adjustable as is well known in the art. It should be here mentioned, however, that such drag may also be obtained by a slip clutch for braking the shaft 12 as is also well known in the art. The spool may also be axially reciprocated as shown, for example, in Patent No. 2,726,052.

The upper portion 26 of shaft 18 is threadedly connected to the lower portion and is functionally integral. On the upper end of shaft 18 above the hub 22 and spool 24 is fastened a line guide casing or winding member 28 the edges of which extend downward beyond the upper flange of said spool 24. A cap 30 encasing the spool 24 and the winding member 28 is suitably secured on the support 10 and is provided with an upper central outlet opening 32 for the line 34.

As may be seen, the line runs from the spool 24 around the lower edge of the winding member 28 thence along its outer surface to the opening 32.

Extending through the hollow shaft 18 is the axially movable spindle 36 urged downwardly by a compression spring 38 anchored to an upper shoulder of the shaft 18 and engaging a lower shoulder on the spindle 36. The shaft 36 may be moved and displaced axially against the urge of the spring 38 by means of a control button 35 extending through or being operable from outside the support or frame 10.

The upper end of the spindle 36 carries a bearing cap member 40 to which is secured a disc 42 provided with an annular brake shoe 44 of rubber or like material. The member 40 is slidably and rotatably received in a bore of the upper portion 26 of shaft 18. Line guide casing or winding member 28, on its outer substantially axially running periphery, is provided with openings for line guide pins 46. Each pin consists of an exchangeable sleeve 48, of hard metal or the like, drawn over a journal 50 of a pin carrier 52 which extends radially inward. The radial slot 54 in the pin carrier 52 receives a guide pin 56 projecting downwardly from the inside of the upper portion of the winding casing 28. Pin carrier 52 is further provided with an upper shoulder 58 having a radially inward directed and upwardly outward inclined face 60. Shoulder 58 projects partially into an opening 62 in the winding member 28 and abuts with its face 60 against the edge of the disc 42 when the pin 46 is in projected position as shown in FIG. 1.

A leaf spring 64 has an opening 66 through which pin sleeve 48 will pass until the flange 68 abuts the spring. The free ends of spring 64, as may be seen in FIG. 2, abut the inner surface of the winding member 28 in such a fashion as to urge pin 46 radially inwardly and when face 60 bears against disc 42 the spring likewise maintains the pin carrier 52 in the horizontal position illustrated in FIG. 1.

An annular or polygonal leaf spring 70 cured according to the profile shown in FIG. 1 is fastened by engagement under the clips 72 to winding cup 28 (FIG. 2). The

spring 70 urges the pin carrier 52 upwardly from the position shown in FIG. 3 toward the position shown in FIG. 1. It should be noted that spring 64 also by its torsional forces urges carrier 52 to this upward position. This may be observed from the position of the spring 64 in FIGS. 3, 5 and 7.

With the parts in the position shown in FIG. 1, rotation of the shaft 12 by means of its crank (not shown) rotates line guide casing or winding member 28 through gears 14, 16 and shaft 18. This causes pin 46 projecting from casing 28 to coil the line on the spool 24 in a manner well known in the art. When the line having been retrieved it is desired, for example, to make a cast, the button 35 is pressed raising the spindle 36, cap bearing 40, disc 42 and shoe 44. The brake shoe 44 clamps the line 34 against the inner surface of the cover 30, frictionally preventing outward passage of the line. Meanwhile, the upward movement of the edge of the disc 42 releases the face 60 of the shoulder 58 permitting spring 64 to move pin 46 and pin carrier 52 radially inward until the outer end of slot 54 contacts guide pin 56. Pressure may now be relieved partially or entirely on the button 35 to permit the line to pass out between the brake shoe 44 and the inward side of the cap 30. The radially outward end of the pin 46 remains level or slightly inwardly of the outer surface of winding member 28. Since the pin is no longer in a line engaging position the line will play out freely on the cast off the spool 24 and around the winding member 28. A fisherman may play his cast by means of the button 35 operating the brake shoe 44 against the line and the inner wall of the cap 30. When pressure is removed entirely from the button 35 the spring 38 urges the spindle 36 downwardly and with it brake shoe 44 and disc 42 which now engages the upper surface of shoulder 58 moving the parts to the position shown in FIG. 3. The spring 38 overcomes the stabilizing force of the springs 64 and 70 and swings pin carrier 52 down around the end of pin 46 which is still engaged in the opening of the line guide casing 28 so that the inner extremity of the carrier comes to rest on the upper end surface 74 of hub 22 or the upper end surface of cam lobe 76 formed on hub 22. If the cam lobe 76 is contacted no untoward action occurs, but disc 42 remains somewhat higher than illustrated in FIG. 3.

When the fisherman commences the rewinding of the line, line guide casing or winding member 28 starts rotating and carries with it the pin 46 and pin carrier 52 since these members are secured to the winding casing at the pin hole and at the guide pin 56. The inside extremity of the pin carrier 52 will during rotation pass along the inner surface 74 of hub 22 until it strikes against the edge of the cam lobe 76 by which the pin carrier 52 is moved radially outwardly. As the pin carrier 52 moves radially outwardly the upper end of stop face 60 is released from beneath the edge of disc 42. The disc then can move downwards to the position of FIG. 1 at the same time that the pin carrier 52 is turned upwardly by the springs 64 and 70. The inclined shape of the stop face 60 causes a slight but additional radially outward movement of the pin carrier 52 so that the inside extremity thereof is safely removed from the cam 76. Accordingly, in the extended position of the pin there is no frictional engagement between the pin carrier and its stationary cam. That is to say, once the pin is extended casing and pin are freely rotating.

It should be noted that the structure as herein shown illustrates two operative pins. This number may be decreased to one or increased to as many as may be conveniently desired without change in constructional design, with the possible exception of the shape and fastening means of the leaf spring 70.

The embodiment illustrated in FIGS. 4 and 5 differs from the embodiment of the FIGS. 1 to 3 in that the pin carrier or pin carriers and the retaining means depending on the displacement of the brake shoe are differently constructed and arranged.



As shown in FIGS. 4 and 5, the pin carrier has the form of a plate 78 slightly inclined downwardly inward relative to the axis of pin 46. Plate 78 is provided with two vertically downwardly directed flanges 80 terminating both sides of the plate in a line parallel to the axis of pin 46. The plate is further provided with a longitudinal slot 82. A locking disc 84 corresponds to the disc 42 of the FIGS. 1 and 2 embodiment but is formed as a separate part though securely connected with brake shoe 86. Locking disc 84 is provided for each pin carrier with a journal 88 projecting downwardly from an opening in the upper portion of the line guide casing 28 and thence through the slot 82 in the pin carrier 78. To the lower end of journal 88 is secured a sleeve 90 which in turn at its lower end has a flange 92. The sleeve 90 serves as a guide for the slot 82 during the radial displacement of the pin carrier 78 while its flange 92 limits the downward turning motion of the pin carrier around the passage of the pin in the line casing 28.

A washer 94 drawn over the journal 88 normally is maintained in abutment against the upper end of sleeve 90 by means of annular leaf spring 96, the same type as the spring 70 shown in FIG. 1 but with the difference that spring 96 exercises a downward force on the washer. The conical transition surfaces of the journal 88 from a narrower central to a larger end portion reliably centers the washer 94 in its normal position as shown in FIG. 4. The outer periphery of washer 94 has the form of a downwardly tapered conical surface. A stop face 98 formed on the upper surface of the carrier 78 is inclined downwardly inwardly to mate the washer's surface as illustrated in FIG. 4.

The remaining details are equivalent to those shown in FIGS. 1 to 3 embodiment and are provided with corresponding reference characters. When the spindle 36 is moved upwards, disc 84 and brake shoe 86 are lifted together with the journal 88 relative to the line guide casing 28. The inside extremity of the pin carrier 78 is lifted by the flange 92 of the sleeve 90. Washer 94 is maintained in a horizontal position by the spring 96, while the plate-like pin carrier 78 reduces its inclination relative to the horizontal plane. This moves the stop face 98 downwardly from the edge of the washer 94 releasing the pin carrier 78 to be displaced radially inward by its leaf spring 64 to retract the pin 46. Raising of the pin carrier 78 to the horizontal plane likewise permits it to clear the cam 76. When spring 38 (aided in this instance by the spring 96) is again permitted to lower spindle 36, the pin carrier 78 is moved downward so that its inside extremity 100 contacts the upper surface of the cam 76 or the upper end surface 74 of hub 22 as shown in FIG. 5. Comparison of FIG. 5 with FIG. 3 further illustrates that the brake shoe 86 is entirely returned to its starting position and does not remain as in FIG. 3 with its disc 42 at some distance from the lower abutment position against the upper surface of the winding member 28. In the embodiment according to FIGS. 4 and 5, the inside extremity 100 of the pin carrier 78 remains in abutment against the hub 74 or cam 76 without support from the flange 92 of the sleeve 90.

When the line guide casing 28 is rotated with the details arranged as illustrated in FIG. 5, the pin carrier 78 is displaced outwardly by the cam 76 until the stop face 98 falls in outside the edge of the washer 94. As the stop face 98 slides across the edge of washer 94 and while the washer returns to its horizontal position, pin carrier 78 is imparted an additional outward displacement motion equivalent to the distance "*a*" illustrated in FIG. 4 so that its extremity is removed the distance "*a*" from the cam 76. Thus, during continued rotation of winding member 28 the inner end 100 of the pin carrier 78 will never contact cam 76 nor hub 74. Accordingly, once the pin extends radially it is free from frictional drag on the stationary hub and cam 74 and 76.

In the embodiment illustrated in FIGS. 6 and 7, the spindle 36 is by means of an enlarged journal 102 firmly

connected to a brake shoe 44 designed in like manner to the brake shoe illustrated in FIG. 1 and with a supporting disc 42. The spring 38 acts downwardly upon the spindle as in FIG. 1.

Central journal 102 is freely rotatable and movably guided in a widened hub sleeve 104 on which is mounted the line guide casing 28. Hub sleeve 104 is threadedly connected to drive shaft 18. The pin carrier 106 carries on its outer end the pin cap or pin sleeve 48 extending through line casing 28, and which may be urged inwardly by the leaf spring 64. The inner extremity 107 of the pin carrier 106 projects into a slot 108 in the hub sleeve 104 of line guide casing 28. The central journal 102 has formed in it an annular groove 110, whose upper edge has a beveled face 112. The pin carrier 106 additionally has a radially inwardly directed shoulder 114 formed on its lower side.

It will be understood that in the normal coiling position illustrated in FIG. 6 the inner extremity 107 of the pin carrier 106 rests against face 112 of journal 102 and is prevented from moving further downward by abutting against the lower end of the slot 108. In this position, the shoulder 114 is outside the effective zone of action of cam 76. When the spindle 36, central journal 102, disc 42 and brake shoe 44 are displaced upward, the groove 110 first aligns itself with the inner end 107 of the carrier 106 which under the urge of the spring 64 enters the annular groove 110. The continued upward displacement of central journal 102 raises the inside extremity 107 of arm 106. As may be seen to the left in FIG. 6, this function cannot fail because of chance contact between the cam 76 and the shoulder 114. In either position the extreme inside extremity of the arm 106 will be lifted freeing the shoulder 114 from the cam so that the arm 106 can fully enter annular groove 110 as illustrated in FIG. 7.

When the spindle 36, central journal 102, disc 42, brake shoe 44 are released downward under the urging of spring 38 the carrier extremity 107 is taken along downward to rest against the lower end of the slot 108 or the shoulder 114 rests against the upper surface of the cam 76.

Subsequent rotation of the casing 28 eventually carries the shoulder 114 to the edge of the cam 76 moving the carrier 106 radially outward until the upper edge of extremity 107 reaches the lower edge of the bevel surface 112. The journal 102 is then released and moves downwardly to the starting position by the effect of the spring 38. Bevel surface 112 then imparts to the arm 106 an additional motion lifting the shoulder 114 free from the cam 79. Casing 28 now can rotate freely around without pin carrier arm 106 or shoulder 114 frictionally contacting cam 76 or hub 22.

I claim:

1. In a spinning reel having a line carrying spool and a winding member mounted for rotation about said spool, a line engaging guide movable in said member to a line engaging position, stationary trip means to move said guide during rotation of said member to said position, detent means rotatable with said winding member to engage, move and retain said guide from said trip in said position, means mounting said detent for axial movement said detent means being selectively movable axially out of guide retaining position and then axially movable into position to move said guide to engage said trip.

2. In a spinning reel having a line carrying spool and a winding member mounted for rotation about said spool, a line engaging guide movable in said member toward a line engaging position, stationary trip means to move said guide during rotation of said member toward said position, and detent means rotatable with said winding member and having mounting means mounting said detent on said winding member for movement axially thereto to engage and urge said guide out of engagement with said stationary trip means.

3. In a spinning reel having a support, a line carrying spool supported thereon, a winding member mounted for rotation about said spool, a line engaging guide radially slidable on said member to a line engaging position, stationary trip means to move said guide during rotation of said member toward said line engaging position, said guide when in said position being movable out of engagement with said trip, instrumentalities including means to engage said guide for movement out of engagement with said trip when said guide is so moved to line engaging position, and a detent rotatable with said member to retain said guide in line engaging position out of engagement with said trip, said detent being selectively movable out of guide retaining position and at least some of said means of said instrumentalities urging said guide past said trip during its movement out of said line engaging position.

4. In a spinning reel having a support, a line carrying spool supported thereon, a winding member mounted for rotation about said spool, a line engaging guide radially slidable on said member to a line engaging position, said guide further being mounted for movement axially of said winding member, resilient means to urge said guide radially from said line engaging position, a stationary trip to move said guide during rotation of said member toward said line engaging position, a detent rotatable with said member to engage and cam said guide radially from engaging said stationary trip, instrumentalities to thereupon move said guide axially clear of said trip, said detent being selectively movable out of guide engaging position to permit said resilient means to move said guide out of line engaging position, said guide being axially clear of said trip, and means to selectively return said guide axially for engagement with said trip upon rotation of said member.

5. In a spinning reel having a line carrying spool, a winding member rotatable about said spool, a radially extensible line engaging guide, resilient means engaging said guide to resist such extension, and a stationary trip to extend said guide upon rotation of said winding member, the structure comprising a mounting rockably supporting said guide for further movement axially in said winding member clear of said trip and instrumentalities to engage and hold said guide in its extended position and to rock said guide axially clear of said trip, said instrumentalities including a detent movably mounted in said member and selectively movable to an inoperative position, whereby said guide may be retained extended, axially free of said trip and, upon selective movement of said detent to inoperative position, released to be moved radially by said resilient means and still axially free of said trip.

6. In a spinning reel having a rotating winding member and a retractable line engaging finger, the combination with a stationary trip for extending said finger, of finger engaging means mounted on and rotating with said winding member, said finger being movably mounted in said winding member and having a formed portion adapted to be engaged by said stationary trip during rotation of said winding member and said finger engaging means having a portion positioned to engage said finger when said finger has been extended by said stationary trip, at least one engaged portion of said finger and said finger engaging means having a formed face coacting with the other upon engagement to produce a further camming action to raise said finger clear of said stationary trip.

7. A device substantially as set forth in claim 6 in which said finger engaging means mounted and rotating with said winding member is movable from a finger engaging position to a non-finger engaging position, and a device to move said means to said non-engaging position.

8. A spinning reel of the type comprising a frame, a spool mounted in said frame, a winding member rotatably mounted adjacent said spool, a pick-up pin radially slidable and axially rockable on said winding member, re-

silient means urging the pick-up pin to a first radial position on the winding member, retaining means displaceable axially from a rest location for maintaining the pick-up pin in a second radial position against the bias of said resilient means to a release location to release the pick-up pin for radial movement to said first radial position, a stationary trip adapted upon rotation of the winding member to move the pick-up pin radially to said second radial position, further characterized in that abutment means are formed on said pin and said retaining means and the retaining means upon return to the rest location engages and rocks the pin axially to within the range of the trip, and at the end of the radial displacement of the pin to said second position said abutment means on said pin and said retaining means coact to rock said pin axially from said trip.

9. A spinning reel according to claim 8, characterized in that at least one of said abutment means on said pin and said retaining means comprises a face inclined to the direction of the displacement of the pin by the retaining means to cam said pin radially from said trip at the end of the return of the pin to said second position.



10. In a spinning reel having a line carrying spool and a winding member mounted for rotation about said spool, a line engaging guide movable in said member to a line engaging position, stationary trip means to move said guide during rotation of said member to said position, detent means rotatable with said winding member to engage, move and retain said guide from said trip in said position during rotation of said winding member, means mounting said detent for selective axial movement, said detent means being selectively movable in one axial direction to move said guide from said trip and movable in a reverse direction out of engagement with said guide, said guide being then free to move out of line engaging position.

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