

Jan. 20, 1959

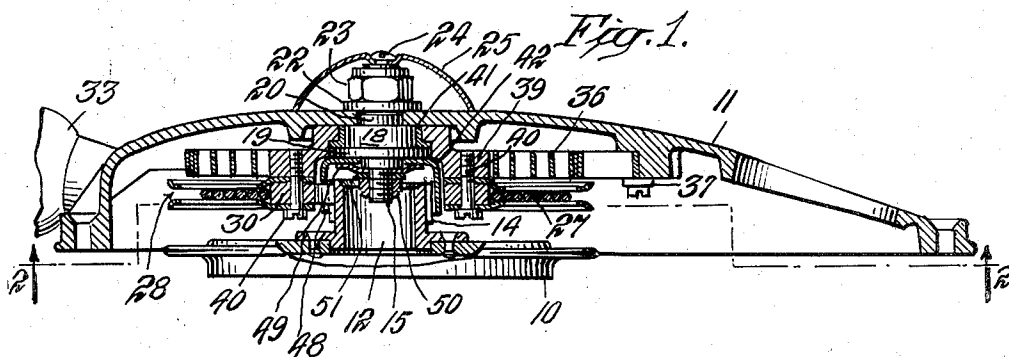
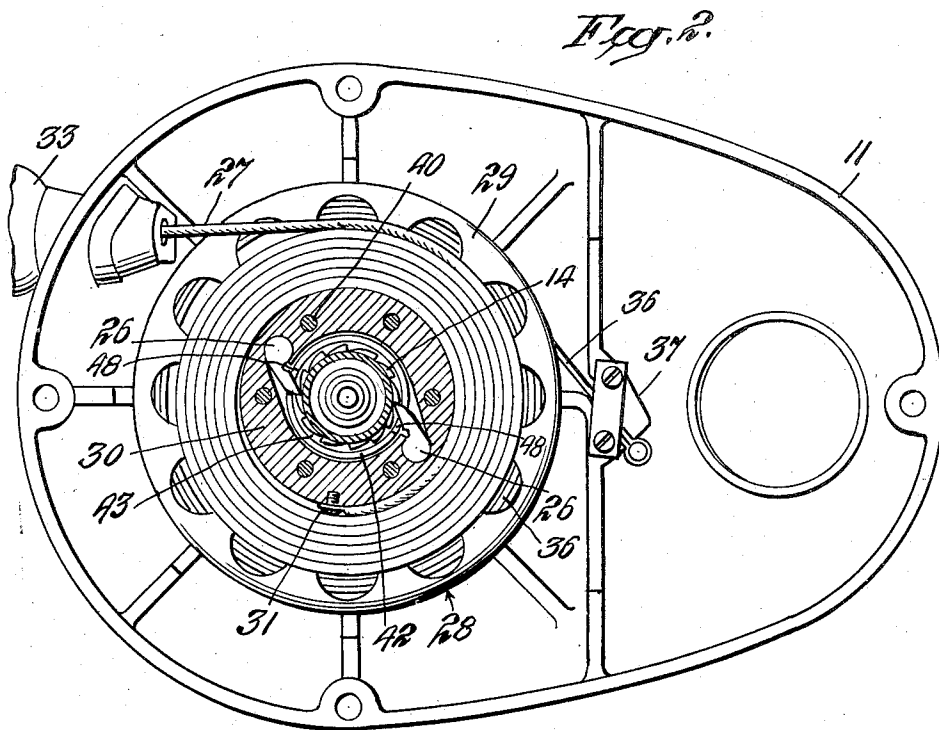
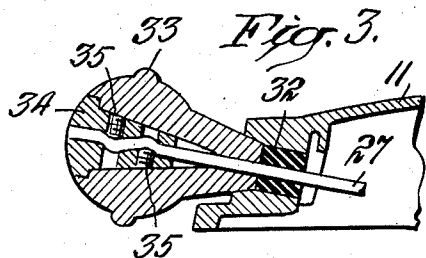
K. I. CEDERMARK

2,869,531

STARTER FOR OUTBOARD MOTORS

Filed Feb. 9, 1955

3 Sheets-Sheet 1



INVENTOR.
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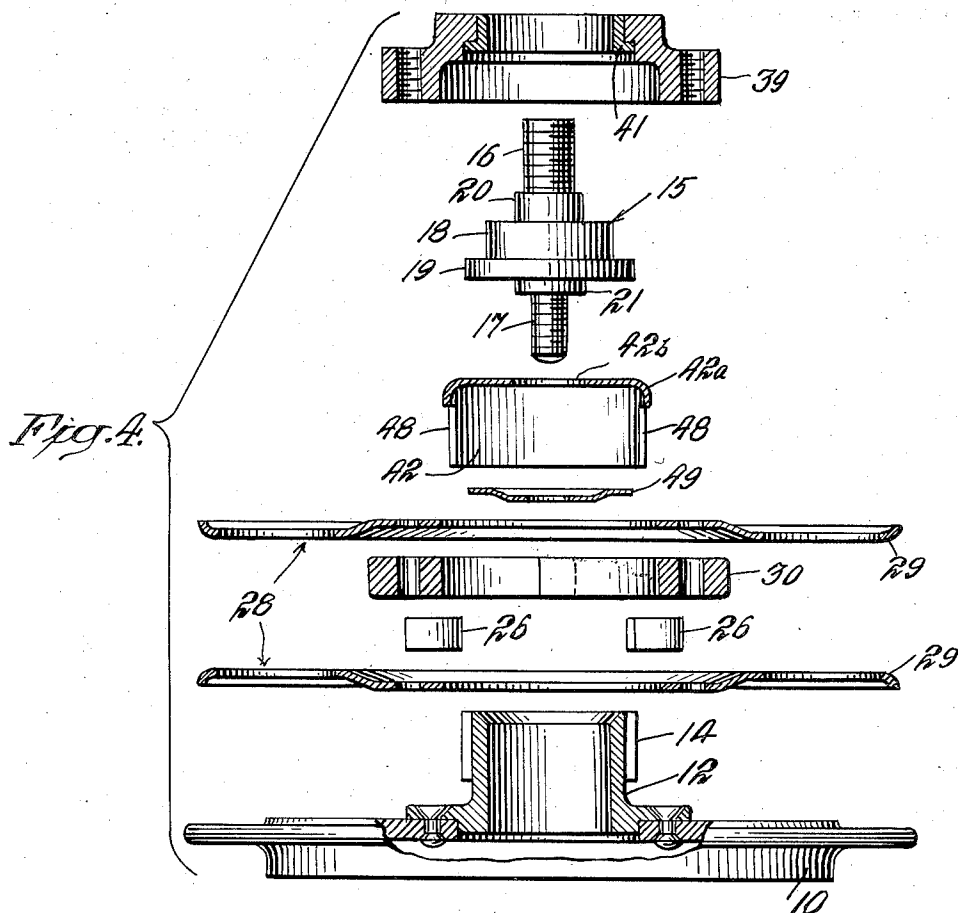
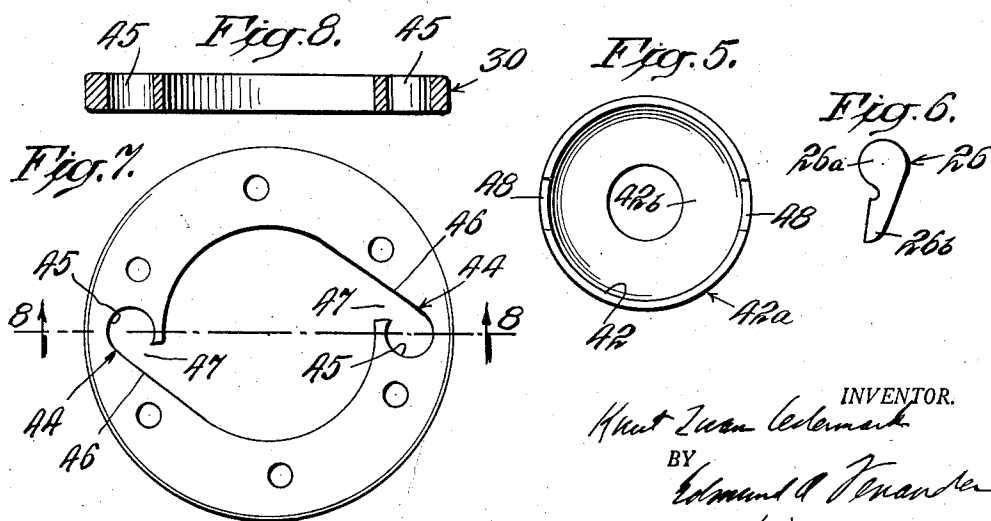
K. I. CEDERMARK

2,869,531

STARTER FOR OUTBOARD MOTORS

Filed Feb. 9, 1955

3 Sheets-Sheet 2



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STARTER FOR OUTBOARD MOTORS

3 Sheets-Sheet 3

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2,869,531

STARTER FOR OUTBOARD MOTORS

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Application February 9, 1955, Serial No. 487,044

Claims priority, application Sweden February 12, 1954

14 Claims. (Cl. 123—179)

My invention relates to outboard motors, and has as an object the provision of an improved mechanical starter therefor, which embodies cooperating elements that always move easily and freely with respect to one another, to enable their being started smoothly with a minimum of effort.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the claims. The invention, both as to organization and method, together with the objects thereof, will be better understood by reference to the accompanying drawings, of which Fig. 1 is a vertical section of a starter for outboard motors embodying my invention; Fig. 2 is a horizontal sectional view taken at line 2—2 of Fig. 1; Fig. 3 is a fragmentary vertical section of the handle of the starter shown in Figs. 1 and 2; Fig. 4 is an exploded elevation view, partly in section, of parts of the starter shown in Figs. 1 and 2 to illustrate details more clearly; Figs. 5, 6 and 7 are plan views of parts illustrated in Fig. 4; Fig. 8 is a sectional view taken at line 8—8 of Fig. 7; Fig. 9 is a fragmentary bottom plan view of parts shown in Figs. 1 and 2; and Figs. 10 and 11 are similar bottom plan views, partly in section, of parts shown in Figs. 1 and 2, to illustrate more clearly the operation of the starter.

In Figs. 1 and 2 I have shown only a flywheel 10 and a cover 11 of an outboard motor to which my invention is applied, since an illustration of these parts is all that is necessary for an understanding of the invention. To the flywheel 10, which is secured in any suitable manner to the vertical crankshaft (not shown) of the motor, is fixed a hollow sleeve 12 having teeth at the outer periphery thereof forming a ratchet wheel 14. The cover 11 is removably secured in any suitable manner to the housing or casing of the outboard motor.

The starter for the outboard motor, which is disposed within the cover 11, includes a stationary stud or pin 15 having top and bottom threaded sections 16 and 17, respectively, an intermediate enlarged section including flanges 18 and 19, and raised bosses 20 and 21 projecting axially therefrom, as best shown in Figs. 1 and 4. The cover 11 is formed with an opening to receive the top boss 20 of the stud 15, the top threaded section 16 of which receives a washer 22 and tightening nut 23. The extreme upper end of the stationary stud 15 receives a cap screw 24 for removably holding in position a cap 25 which overlies the tightening nut 23 and conceals the latter from view.

As best shown in Fig. 2, rotating movement is imparted to ratchet wheel 14 by pawls 26 with the aid of a rope or cord 27 which is wound about a drum 28 having spaced apart side walls 29 and an apertured plate or disk 30 forming a hub of the drum. The inner end of the rope 27 is secured at 31 to the hub 30, and the outer end thereof, which passes through an apertured resilient bushing 32 positioned in an opening in the cover 11, is secured to a handle 33, as seen in Figs. 2 and 3.

The handle 33, which is formed as a knob so that it can be readily grasped in the hand, is formed with a

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central passage which includes a conical-shaped portion that receives a similarly shaped plug 34. The plug 34 is provided with a pair of set screws 35 which are eccentrically disposed with respect to the axially extending plug opening through which the outer end of the cord 27 passes. When the plug 34 is removed from the handle 33, the set screws 35 can be tightened to fasten the plug to the cord 27, such tightening of the set screws producing a double bend in the cord.

When the handle 33 is released, the cord 27 is wound on the drum 28 with the aid of a spiral-shaped spring 36. As best shown in Fig. 9, the outer end of the spring 36 is secured at 37 to the underside of the cover 11, and the inner end thereof is secured at 38 to a hollow sleeve 39. Hence, the pulling action of the cord 27 on the plug 34, which is effected by the spring 36, tends to hold the latter in the conical-shaped portion of the hollow handle 33, as shown in Fig. 3.

The drum 28 and hollow sleeve 39 are secured to one another and form a unitary member which is freely rotatable on the stud or pin 15. The hollow sleeve 39 is formed with a number of openings which threadedly receive bolts 40, the latter passing through aligned openings in the side walls 29 and inner cylindrical plate or hub 30 of the drum 28 to hold these parts together.

The hollow sleeve 39 is journaled on the stud 15 by an L-shaped bushing 41 having a vertically extending part disposed about the flange 18 and an horizontally extending part bearing against the top face of the wider flange 19. When the parts thus far described are in the position shown in Figs. 1, 2 and 3, the cord 27 is wound about the drum 28, and the handle 33 is held at the opening in the cover 11 by the action of the spring 36. When the handle 33 is pulled to unwind the cord 27 from the drum 28, the tension of the spring 36 increases, because the drum 28 and hollow sleeve 39 rotate as a single member about the stationary stud 15. When the handle 33 is subsequently released, rotating movement is imparted to the drum 28 by the spring 36 which is under considerable tension, thereby effecting winding of the released cord on the drum until handle 33 engages the cover 11 at the immediate vicinity of the opening through which the cord 27 passes.

In accordance with my invention, the pawls 26 are carried by and movable with the apertured plate 30, and an annular or ring-shaped element 42, which is frictionally secured to the stud 15, is employed to guide the pawls into engagement with the ratchet wheel 14 when the cord 27 is initially pulled to impart rotating movement to the flywheel 10. As best shown in Fig. 1, the apertured plate or disk 30, which is held between the inner peripheral portions of the side walls 29 of the drum 28, is at the same level as the ratchet wheel 14 and disposed about the latter. As seen in Figs. 10 and 11, the central opening in the apertured plate 30 is of such size that a gap 43 is provided between the ratchet wheel 14 and the inner peripheral wall of the plate 30.

Notches or recesses 44 are formed at the inner wall of the apertured plate 30 at diametrically opposing sides thereof. Each of the recesses 44 includes a cylindrical or circular portion 45 having an angle of envelopment which is greater than 180°, and a flat portion 46 which merges with the inner peripheral wall of the apertured plate and is tangent to the cylindrical or circular portion 45. The pawls 26 include circular portions 26a which are retained and snugly fit in the cylindrical portions 45 of the recesses 44, and outwardly extending arm portions 26b adapted to engage the teeth of the ratchet wheel 14, the arm portions projecting into the gap 43 through narrow passages 47 at the regions the recesses 44 communicate with the central opening within the apertured plate 30.

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In the preferred embodiment being described, the annular or ring-shaped element 42, which serves to guide the pawls 26 into engagement with the ratchet wheel 14, is vertically disposed in the gap 43 at the region of the ratchet wheel 14 and apertured plate 30. As best shown in Figs. 4 and 5, the ring-shaped element 42 forms the side wall of an inverted cup-shaped member 42a having an apertured base 42b. The ring-shaped element 42 is formed with recesses or notches 48 at diametrically opposing sides thereof through which the pawls 26 may pass during operation of the starter, as will be explained more fully hereinafter.

The ring-shaped element 42 may be referred to as a guide member which is frictionally held on a stationary part of the starter. In the preferred embodiment, the cup-shaped member 42a is frictionally secured to the stud or pin 15 in an inverted position, as best shown in Fig. 1. The frictional engagement is effected by an apertured dish-shaped metallic member 49 which is springy or resilient in character. The friction member 49 is located within the cup-shaped member 42a and frictionally engages the inner surface of the base 42b thereof, the outer surface of the base 42b being held against the underside of the flange 19 on the stud or pin 15. The extent of the frictional engagement effected between the stud or pin 15 and the friction member 49 may be regulated by adjusting a tightening nut 50 which bears against a washer 51 which in turn engages the underside of the friction member 49.

The operation of the starter just described is substantially as follows: When the knob 33 is pulled from the cover 11 to unwind cord 27 from the drum 28, the tension of spring 36 increases, because the drum 28 and hollow sleeve 39 rotate as a single member about the stationary stud 15. As the cord 27 is being unwound from the drum 28, rotating movement is imparted to the apertured plate or hub part 30 in which the pawls 26 are positioned. Hence, the pawls 26 are bodily carried by the apertured plate 30, and move with the latter about the stationary stud 15. When movement is initially imparted to the plate 30 and pawls 26 carried thereby, the ring-shaped element or guide member 42 remains stationary because it is frictionally held in place by the friction member 49.

With movement being imparted to the plate 30 and pawls 26 in a counterclockwise direction in the direction of the arrow A, as seen in Fig. 10, the leading edges of the arms 26b of the pawls will engage and contact the axially extending edges 52 of the diametrically opposing notches 48 of the ring-shaped element or guide member 42. Since the pawls 26 are moving with respect to the guide member 42, the pawl arms 26b move over the edges 52 of the notches and turn radially inward, the circular portions 26a of the pawls rotating in the recesses 45 of the plate 30 with such movement of the pawls. Hence, the ring-shaped element 42 serves to guide the pawls 26 and bring the latter into engagement with the ratchet wheel 14.

With the pawls 26 in engagement with the ratchet wheel 14, and with continued outward pull on the knob 33 to unwind cord 27 from the drum 28, the leading edges of the pawl arms 26b, while in contact with the axially extending edges 52 of the notches 48, will impart rotating movement to the guide member 42 in the direction of the arrow A, as shown in Fig. 10. This occurs when the force exerted on the guide member 42 by the pawls 26 is sufficiently great to overcome the frictional engagement of the guide member on the stud 15. Since the crankshaft of the outboard motor is connected to the flywheel 10, and the ratchet wheel 14 in turn is connected to the latter, rotating movement imparted to the ratchet wheel 14 will be effective to turn the motor crankshaft and effect starting of the outboard motor.

When the cord knob 33 is released, the spring 36, which is under considerable tension, will be effective to

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impart rotating movement to drum 28, whereby the cord 27 will be wound thereon. When this occurs, plate 30 will be moved in a clockwise direction in the direction of the arrow B in Figs. 10 and 11, thus causing the pawls 26 to be moved out of engagement with the ratchet wheel 14. During this relatively short interval of time, the friction member 49 effectively holds the guide member 42 stationary on the stud 15.

When the pawls 26 have moved radially outward to such an extent that the projecting arms 26b thereof bear against the flat portions 46 of the recesses 44, as seen in Fig. 11, the pawls 26 can no longer rotate or turn about the circular portions 45 of the recesses, and will remain stationary on the plate 30 while the latter is moving clockwise in the direction of the arrow B. With such movement of the plate 30, the projecting arms 26b of the pawls engage and come in contact with the axially extending edges 53 of the notches 48 of the guide member 42, as shown in Fig. 11. When the force exerted on the guide member 42 by the pawls 26 is sufficiently great to overcome the frictional engagement of the guide member on the stud 15, the guide member will rotate as a unit with the plate 30 and pawls 26 mounted thereon. Hence, when the cord 27 is wound on the drum 28, and rotating movement no longer is being imparted to plate 30, the pawls 26 will be in the position shown in Fig. 11 when the cord 27 again is pulled from the drum 28 to start the outboard motor. In such position, the pawls 26 are effectively locked in an inoperative position between the flat portions 46 of the recesses 44 and the edges 53 of the notches 48 in the guide member 42.

In view of the foregoing, it will now be understood that an improved starter has been provided for mechanically starting outboard motors, in which the cooperating elements always move easily and freely with respect to one another, and the tendency for elements to jam is completely avoided. The notches or recesses 44 in the plate 30 essentially form housings for the pawls 26, in which the latter are always freely turnable about their pivotal axes. The free turning movement of the pawls 26 is promoted by providing the circular portions 26a which are freely journaled in the cylindrical portions 45 of the recesses. The pawls 26 are held in position by the side walls 29 of the drum 28, the latter serving as retaining walls to prevent axial movement of the pawls.

Since the pawls 26 always assume the position shown in Fig. 11 after the cord 27 is released and has been wound on the drum 28 by the action of the spring 36, the pawls 26 will always move radially inward in paths of movement which are free of any obstructions when the starter is operated the next time. Further, all of the forces for effecting operation of the starter are produced and transmitted through cooperating elements disposed at essentially the same horizontally extending plane transverse to the axis of the stud 15. By reason of this construction, the outboard motor to which the flywheel 10 is connected may be started smoothly with a minimum of effort.

Modifications of the embodiment of my invention which I have described will occur to those skilled in the art, so that I desire my invention not to be limited to the particular arrangement set forth and intend in the claims to cover all modifications which do not depart from the spirit and scope of the invention.

What is claimed is:

1. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, one or more pawls carried by said structure and pivotally movable with respect thereto, an element connected to the flywheel which is adapted to be engaged by said pawl or pawls, a guide member, means for mounting said guide member in frictional engagement with said stationary part, said guide member having a part disposed between said

element and said rotatable structure at the vicinity of said pawl or pawls, means including said guide member for guiding said pawl or pawls into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during movement thereof toward said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawl or pawls are in engagement with said element connected to the flywheel.

2. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, means operable to effect rotation of said structure and wind said cord on said drum, said last-mentioned winding means being rendered operable responsive to unwinding of said cord from said drum, one or more pawls carried by said structure and pivotally movable with respect thereto, an element carried by the flywheel which is adapted to be engaged by said pawl or pawls, a guide member, means for mounting said guide member in frictional engagement with said stationary part, said guide member having a part disposed between said element and said rotatable structure at the vicinity of said pawl or pawls, means including said guide member for guiding said pawl or pawls into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means also serving to guide said pawl or pawls out of engagement with said element when said windings means effects rotation of said structure in the act of winding said cord on said drum, said guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during movement thereof toward and from said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawl or pawls are in and out of engagement, respectively, with said element connected to said flywheel.

3. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, one or more pawls which are carried by said structure and pivotally movable with respect thereto, an element connected to the flywheel which is adapted to be engaged by said pawl or pawls, a guide member, means for mounting said guide member in frictional engagement with said stationary part, means including said guide member for guiding said pawl or pawls into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during movement thereof toward said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawl or pawls are in engagement with said element connected to the flywheel, and said rotatable structure having a portion which forms a housing for said pawl or pawls and a hub for said drum which extends radially outward from the axis of said stud.

4. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, one or more pawls which are carried by said structure and pivotally movable with respect thereto, an element connected to the flywheel which is adapted to be engaged by

said pawl or pawls, a guide member, means for mounting said guide member in frictional engagement with said stud, said guide member including a part of annular form which is disposed about said element connected to the flywheel, means including said guide member for guiding said pawl or pawls radially inward into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during radially inward movement thereof toward said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawl or pawls are in engagement with said element connected to the flywheel.

5. A starter as set forth in claim 4 in which said guide member of annular form is provided with one or more recesses through which said pawl or pawls are adapted to pass radially inward when being guided by said guiding means.

6. A starter as set forth in claim 5 in which said means for overcoming the frictional engagement of said guide member on said stud includes said pawl or pawls and the edge or edges of the recess or recesses which are in the path or paths of movement of said pawl or pawls after the latter are in engagement with the element connected to the flywheel.

7. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, one or more pawls which are carried by said member and pivotally movable with respect thereto, an element connected to the flywheel which is adapted to be engaged by said pawl or pawls, a guide member, means for mounting said guide member in frictional engagement with said stationary part, means including said guide member for guiding said pawl or pawls into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during movement thereof toward said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawl or pawls are in engagement with said element connected to the flywheel, said rotatable structure including an apertured plate disposed about said element connected to the flywheel, the inner wall of said plate having one or more notches or recesses, said pawl or pawls being disposed in said recess or recesses and pivotally movable therein, and means to hold said pawl or pawls in position and prevent axial movement thereof with respect to said plate.

8. A starter as set forth in claim 7 in which said recess or recesses include a circular portion having an angle of envelopment greater than 180° and a flat portion which merges with the inner peripheral wall of said apertured plate and is tangent to the circular portion, said pawl or pawls having a cylindrical-shaped section which is turnable in the circular portion of said recess and an arm section projecting radially inward toward said element.

9. A starter as set forth in claim 8 in which said guide member is mounted in frictional engagement with said stud and includes a part of annular form which is disposed about said element connected to the flywheel, said guiding means including said guide member being effective to guide said pawl or pawls radially inward into engagement with said element.

10. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable

structure including a drum having a cord wound thereon, means including a spiral spring which is operable to effect rotation of said structure and wind said cord on said drum, said last-mentioned winding means being rendered operable responsive to unwinding of said cord from said drum, one or more pawls which are carried by said structure and pivotally movable with respect thereto, an element carried by the flywheel which is adapted to be engaged by said pawl or pawls, a guide member, means for mounting said guide member in frictional engagement with said stud, said guide member including a part of annular form which is disposed about said element connected to the flywheel, means including said guide member for guiding said pawl or pawls radially inward into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said guiding means including said guide member also being effective to guide said pawls radially outward out of engagement with said element, and said guide member and spiral spring being movable with said pawl or pawls and also with said element when said pawl or pawls are in engagement therewith and rotating movement is being imparted to said rotatable structure in the act of unwinding said cord from said drum.

11. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, one or more pawls which are carried by said structure and pivotally movable with respect thereto, an element connected to the flywheel which is adapted to be engaged by said pawl or pawls, a cup-shaped guide member, means for mounting said cup-shaped guide member in an inverted position on said stud in frictional engagement therewith, the downwardly extending side wall of said guide member forming a ring-shaped part which is disposed about said element connected to the flywheel, means including said guide member for guiding said pawl or pawls radially inward into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means including said ring-shaped part being effective to cause said pawl or pawls to turn about their pivotal axes during radially inward movement thereof toward said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawl or pawls are in engagement with said element connected to the flywheel.

12. A starter as set forth in claim 11 in which said ring-shaped part is provided with one or more vertically extending notches through which said pawl or pawls are adapted to pass radially inward when being guided by said guiding means.

13. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, means operable to effect rotation of said structure and wind said cord on said drum, said last-mentioned winding means being rendered operable responsive to unwinding of said cord from said drum, pawls carried by said structure and pivotally movable with respect thereto, an element carried by the flywheel which is adapted to be engaged by said pawls, a guide member, means for mounting said guide member in frictional engagement with said stationary part, means including said guide member for guiding said pawls radially inward into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means also serving to guide said pawls radially outward out of engagement with said element when said winding means effects rotation of said member in the act of winding said cord on said drum, said guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during movement thereof toward and from said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawls are in and out of engagement, respectively, with said element connected to said flywheel.

tional engagement with said stationary part, means including said guide member for guiding said pawls into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means also serving to guide said pawls out of engagement with said element when said winding means effects rotation of said member in the act of winding said cord on said drum, said guiding means being effective to cause said pawls to turn about their pivotal axes during movement thereof toward and from said element, and means including said pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawls are in and out of engagement, respectively, with said element connected to said flywheel, said rotatable member including a plate having a central opening which is disposed about said element connected to the flywheel, the peripheral wall of said plate having diametrically opposing notches, said pawls being disposed in the notches and pivotally movable therein, and means at the top and bottom sides of said plate to form housings for retaining said pawls in position in said notches and preventing axial movement thereof with respect to said plate.

14. A starter for an outboard motor having a flywheel, such starter comprising a stationary part including a stud, structure mounted for rotation on said stud, said rotatable structure including a drum having a cord wound thereon, means operable to effect rotation of said structure and wind said cord on said drum, said last-mentioned winding means being rendered operable responsive to unwinding of said cord, one or more pawls rotatable about said stud responsive to movement of said rotatable structure, said pawl or pawls being pivotally movable with respect to said rotatable structure and axially immovable with respect to said stud, a cup-shaped guide member, means for mounting said guide member in frictional engagement with said stationary part, said cup-shaped guide member having a side wall disposed about said element connected to the flywheel, means including said guide member for guiding said pawl or pawls radially inward into engagement with said element for imparting rotating movement to the flywheel when said cord is unwound from said drum to effect rotation of said structure, said last-mentioned guiding means also serving to guide said pawls radially outward out of engagement with said element when said winding means effects rotation of said member in the act of winding said cord on said drum, said guiding means being effective to cause said pawl or pawls to turn about their pivotal axes during movement thereof toward and from said element, and means including said pawl or pawls for overcoming the frictional engagement of said guide member on said stationary part and effecting movement of said guide member after said pawls are in and out of engagement, respectively, with said element connected to said flywheel.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,869,531

January 20, 1959

Knut Iwan Cedermark

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

Column 6, line 34, for the word "member" read -- structure --; column 8, line 19, before the word "peripheral" insert -- inner --.

Signed and sealed this 15th day of September 1959.

(SEAL)

Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents