

Dec. 21, 1965

G. C. BASTOW

3,224,706

REELS

Filed July 6, 1962

3 Sheets-Sheet 1

FIG. 1.

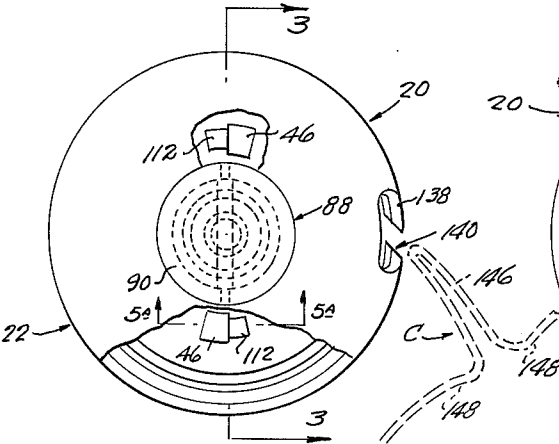


FIG. 2.

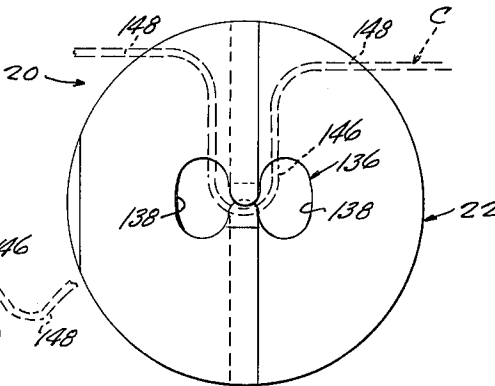


FIG. 3.

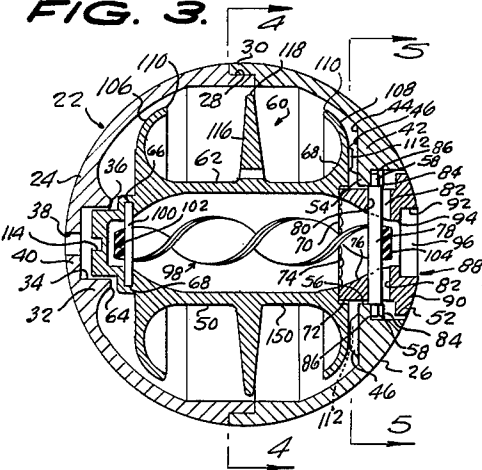


FIG. 4.

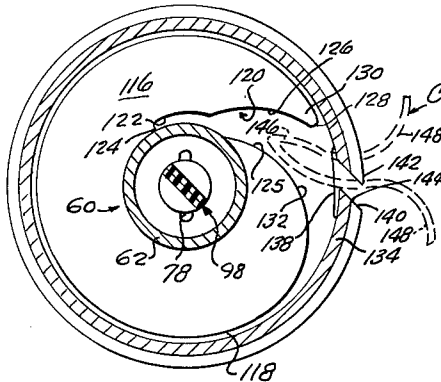


FIG. 5.

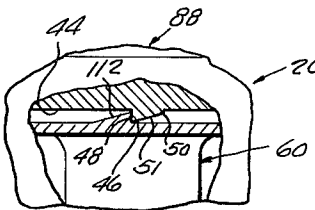
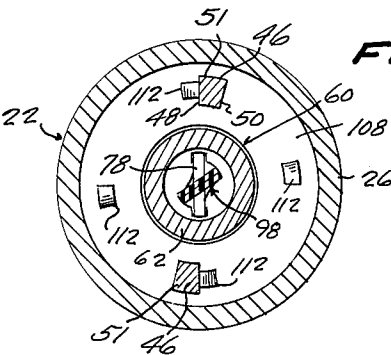


FIG. 5A.

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FIG. 6.

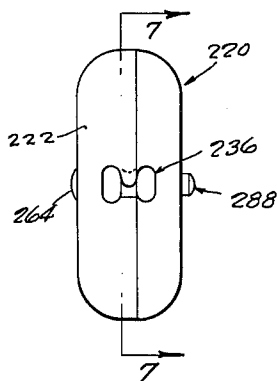


FIG. 7.

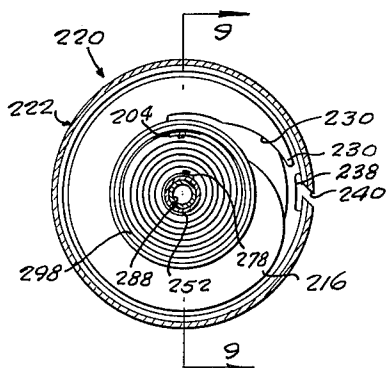


FIG. 8.

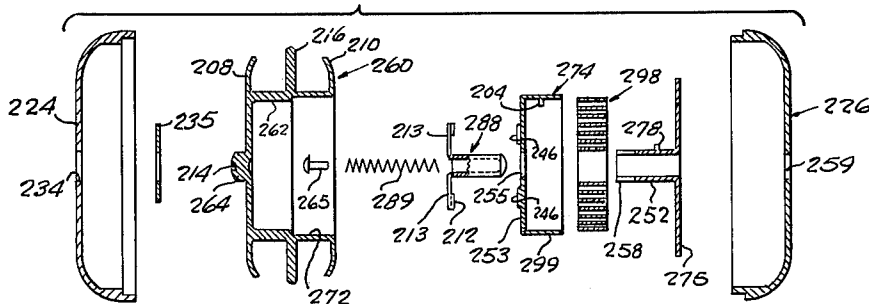


FIG. 9.

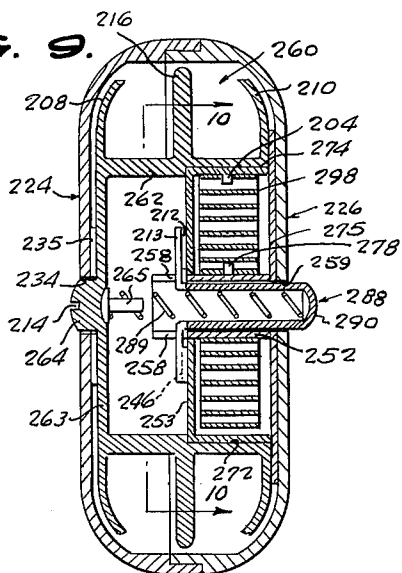
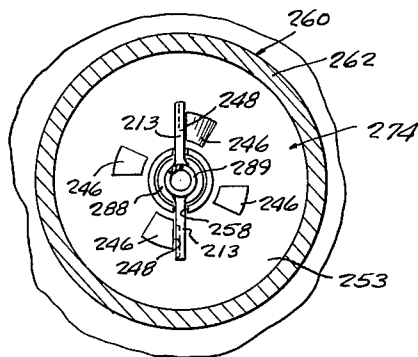


FIG. 10.



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FIG. 11.

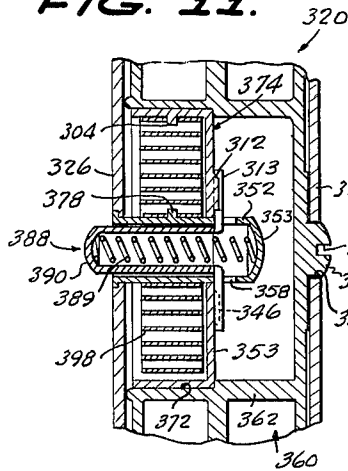


FIG. 12.

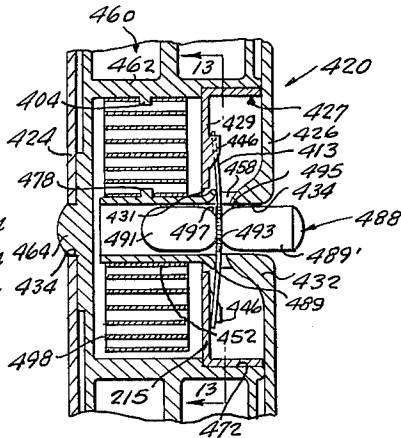


FIG. 13.

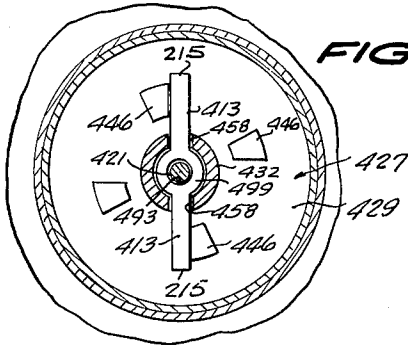


FIG. 14.

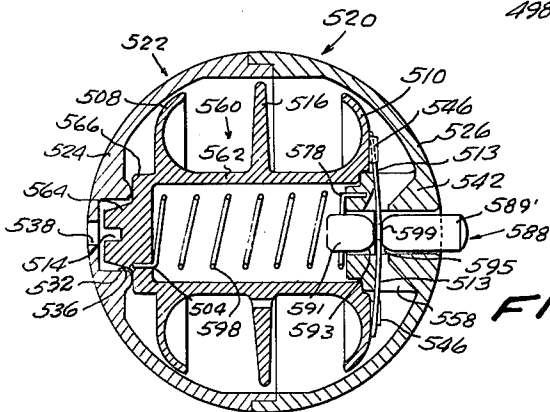
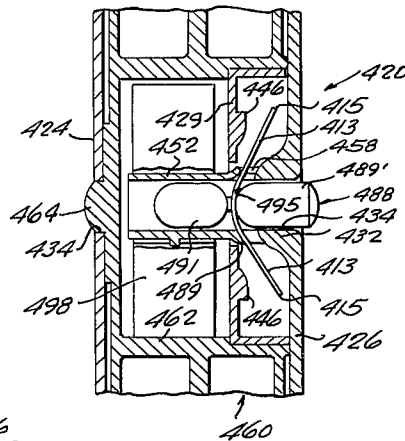


FIG. 15.

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3 Claims. (Cl. 242—107.13)

This invention relates to novel reels of the type having driven, detent arrested twin rotors, and spring-pressed push-button rotor releasers.

The primary object of the invention is the provision of generally superior reels of the kind indicated, which are more efficient and reliable in operation, and which are devised to be easily manufactured of plastic and/or metal materials.

Another object of the invention is the provision of reels of the character indicated above whose twin rotors provide two isolated circumferential grooves, separated by dividing walls, for receiving and reeling on the reels of two different flights of a single cord, passed through specially formed openings in the casings of the reels, the bight of the cord between the flights being secured to the reels by hook and notch means formed in the dividing walls, whereby crossing of the cord flights onto each other is prevented and uniform windings of the two cord flights in their assigned grooves is assured.

A further object of the invention is the provision in reels of the character indicated above, of dual-shaped cord inserting openings in the casings of the reels which facilitate insertion of the bights of cords and their engagement with the hook and notch means of the rotors, and the proper training of the flights in their assigned reel grooves.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, specific forms of the invention are set forth in detail.

In the drawings:

FIGURE 1 is a side elevation, partly broken away of a reel of the present invention, and showing, in phantom lines, a cord formed with a bight preliminary to insertion of the bight into the entrance opening means of the casing;

FIGURE 2 is an end elevation of FIGURE 1, showing the dual opening means of the case of the reel, and showing, in phantom lines, a partially inserted position of the bight of the cord;

FIGURE 3 is a longitudinal section taken on the line 3—3 of FIGURE 1;

FIGURE 4 is a transverse section taken on the line 4—4 of FIGURE 3, showing, in phantom lines, an inserted position of the bight of the cord;

FIGURE 5 is a transverse section taken on the line 5—5 of FIGURE 3;

FIGURE 5a is a horizontal section showing the shapes and arrangements of ratchet detents;

FIGURE 6 is an end elevation of another form of reel of the present invention;

FIGURE 7 is a transverse section taken on the line 7—7 of FIGURE 6;

FIGURE 8 is an exploded schematic view, showing the components of the reel of FIGURES 6 and 7 in longitudinal section;

FIGURE 9 is an enlarged transverse section taken on the line 9—9 of FIGURE 7;

FIGURE 10 is a fragmentary longitudinal section taken on the line 10—10 of FIGURE 9;

FIGURE 11 is a fragmentary longitudinal section, like FIGURE 9, taken through another form of reel of the present invention;

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FIGURE 12 is a view like FIGURE 11 of a further form of reel, showing the pushbutton in "out" position;

FIGURE 13 is a fragmentary transverse section taken on the line 13—13 of FIGURE 12;

5 FIGURE 14 is a view like FIGURE 12, showing the pushbutton in releasing or "in" position; and,

FIGURE 15 is a longitudinal section taken through a still further form of reel of the present invention

Referring in detail to the drawings, wherein like and related numerals designate like and related parts throughout the several views, and first to FIGURES 1 through 5 thereof, the reel therein shown, and generally designated 20, comprises a spherical or globular casing 22, composed of initially separate hemispherical first and second sections 24 and 26, respectively, which are joined together in any suitable manner, as by means of a peripheral groove 28 on the open end of the first section 24, securely engaged by a peripheral tongue 30, in the open end of the second section 26.

20 The first casing section 24 is formed with an internal axial boss 32 which is formed with an axial cylindrical socket 34, the inner end of whose sidewall meets the exterior of the boss to provide a rounded annular friction-reducing bearing edge 36. An axial access opening 38, for an implement, such as a screwdriver (not shown) is formed through the bottom wall 40 of the socket 34, through which an implement is adapted to be passed for rotating the rotor of the reel in the winding direction.

The second casing section 26 is formed with a segmental axial boss 42, larger in diameter than the boss 32 of the first casing section 24, and having a flat chordal inner surface 44. A pair of diametrically opposed ratchet detent blocks 46 projects inwardly from the surface 44. The blocks 46 have radially outwardly divergent leading and trailing sides 48 and 50, respectively, and ramp surfaces 51 angled outwardly from the sides 50 to the sides 48, as shown in FIGURE 5a. The boss 42 is formed with an axially outwardly opening socket 52, larger in diameter than the socket 34 of the first casing section 40 boss 32, and having a bottom wall 54 which is formed with an axial circular opening 56, which opens through the surface 44. The outer side of the bottom wall 54 is formed with a pair of diametrically, opposed, axially outwardly opening notches 58.

45 The reel 20 further comprises a dual rotor 60, which comprises an axial tubular core 62, larger in diameter than the boss 32 of the first casing section 24, and having, on its first end a reduced diameter cylindrical pintle 64 for rotary and slidable engagement in the socket 34 of the first casing portion 24. An enlarged diameter annular bearing shoulder 66 surrounds the pintle, at its inner end, which has a concave outer surface 68 adapted to bear against the bearing edge 36 on the first casing section boss 32.

55 The second end of the rotor core 62 is formed with an axial annular bearing groove 68 which rotatably receives the rounded inner bearing edge 70 of an endwise movable but nonrotatable ring 72. The bearing edge 70 is formed with circumferentially spaced rounded, friction reducing bearing lobes 74. The ring 72 is loosely engaged in the opening 56 of the socket bottom wall 54, and has an axially outwardly tapering bore 76. A diametrical pin 78 bears against the inner ends 80 of longitudinally elongated slots 82, formed through the ring 72, and has its ends 84 engaged with the edge of the opening 56, and has reduced diameter pins 86, on its ends, which are engaged in the notches 58 in the socket bottom wall 54, and are free to move toward and away from the bottom wall 54.

70 The ring 72 is fixed to and extends axially inwardly from and is a part of a circular pushbutton 88 having a

circular head 90 which is larger in diameter than the ring 72, and has a sliding fit in the outer end of the socket 52. The head 90 has a shallow axial access bore 92, opening to its outer end, which has an annular shoulder 94, at its inner end, for stop engagement with a removable plug 96 engaged in the bore 92. The bore 92, and the bore of the rotor core 62 provide access to the interior of the rotor 60, for inspection, and replacement, by means of a suitable implement, of the resilient driving means for the rotor, which is herein illustrated as being a flat, endless rubber band 98.

The band 98 has its first end trained around a fixed diametrical cross pin 100 extending across the bore of the rotor core 62, at the first end thereof, as indicated at 102, and has its second end trained around the pin 78, as indicated at 104.

The rotor 60 further comprises annular concavo-convex first and second end walls 106 and 108, respectively, on the ends of the core 62, with their concave inner sides facing, and with their convex outer sides and peripheral edges 110 spaced from the wall of the casing 22. The second rotor end wall 108 has a circle of equally circumferentially spaced ratchet detent lugs 112, on its axially outward side, which are positioned to be engaged with the leading sides 48 of the ratchet blocks 46, as indicated in FIGURE 5, when the band 98 has been tensioned by inserting a screwdriver (not shown) through the opening 38 in the bottom wall 40 of the socket 34 of the first casing section 24, into a kerf 114 provided in the pintle 64, and rotating the rotor 60 in a direction to unwind cord from the rotor, so that upon release of the rotor, by pushing the pushbutton 88 axially inwardly and moving the rotor toward the first casing section 24 and thereby moving the ratchet lugs 112 inwardly out of the reach of the ratchet blocks 46, the band is freed to operate and rotate the rotor in a direction to wind the cord onto the rotor. The ratchet lugs 112 have ramp surfaces 111, angled oppositely to the ramp surfaces 51 of the ratchet blocks 46, for engagement with and ratchetting over the ramp surfaces 51.

The rotor 60 further comprises an annular dividing wall 116 which is radially outwardly tapered, as shown in FIGURE 3, and is fixed to the core 62 midway between its end walls 106 and 108. The dividing wall 116 has a rounded peripheral edge 118 which is spaced from but runs close to the wall of the casing 22. The wall 116, as shown in FIGURE 4, is formed with a generally chordal notch 120 which has a relatively narrow inner end portion 122, having a closed inner end 124 which is located at the surface of the core 62 and inwardly beyond the axis of the core. The notch 120 further comprises a relatively wide, outwardly flaring outer end portion 125, which opens through the peripheral edge 118 of the wall 116. The wide outer end portion 125 is defined by a longitudinally and concavely curved leading edge 126 which meets the peripheral edge 118 in a rounded nose 128, and which defines a hook 130, and by a longitudinally and convexly curved trailing edge 132, which merges curvedly into the peripheral edge 118.

The wall 134 of one side of the casing 22 is formed with a dual entrance opening 136, which is composed of two laterally adjacent oval apertures 138 which are in communication with each other only by a relatively narrow slot 140, located intermediate the ends of the apertures 138. As shown in FIGURES 2 and 4, the slot 140 has parallel edges 142 and 144, which are angled downwardly relative to a plane passing through the longitudinal axis of the casing 22, so that, in effect, the edge 142 overlaps the edge 144, and provides a restricted passage for a bight 146 formed in a cord C to be reeled. The slot 140 is aligned with the dividing wall 116 of the rotor 60, so that when the bight 146 is passed through the slot 140, with the flights 148 of the cord C positioned in related ones of the apertures 138, rotation of the rotor 60, in a clockwise direction, as seen in FIGURE 4, by the

means hereinabove described, the hook 130 engages through the bight 146, draws the bight into the narrow inner end portion 122 of the notch 120, so that at the same time the cord flights 148 are pulled into the proper grooves 150 defined between the dividing wall 116 and the end walls of the rotor 60. Continued rotation of the rotor 60, in the same direction, winds the cord flights 148 on the core 62 in their assigned grooves, and positively prevents the flights from crossing over the dividing wall 116 and winding upon each other.

In order to unwind the cord C from the rotor 60, the cord is pulled out in either of two ways. In one, the flights of the cord C are taken in the hands and pulled in opposite directions, with the reel suspended therebetween. In the other way, both cord flights are taken in one hand and the reel in the other, the cord pulled away from the reel, as the ratchet lugs and blocks are cleared over each other, either by pressing in the pushbutton or by ratchetting the lugs over the blocks. Release of pull on the cord permits the ratchet lugs to engage the ratchet dogs, under spring pressure, so that the desired length of cord remains extended from the reel.

In order to reel in the cord C, the push button 88 is pressed inwardly to its in or release position, so as to disengage the detent lugs 112 from the detent blocks 46, so as to free the tensioned band 98 to counterrotate the rotor 60 and wind the cord C thereon. When a sufficient length of the cord C has been reeled in, the pushbutton 88 is released to its out position, so that the detent lugs reengage the detent blocks and halt counterrotation of the rotor 60.

For removing the cord bight 146 from the rotor 60, the rotor 60 is turned to position the notch 130 at the dual opening 136, as shown in FIGURE 4, so that, by pulling outwardly on the flights 148 of the cord, the bight comes out of the notch 130 and follows the flights out the opening 136.

The reel shown in FIGURES 6 to 10, and generally designated 220, comprises a casing 222 which is flat and circular and is composed of first and second sections 224 and 226, respectively, and has journaled thereon a rotor 260. The rotor 260 is generally similar to the rotor 60 of FIGURES 1 through 5, but its core 262 is of substantially greater relative diameter, and the first end of the core is closed by a flat end wall 263 having thereon an axial pintle 264 which is journaled through a hole 234 in the wall of the first casing section 224, and provided with a screwdriver kerf 214. A washer 235 is interposed between the end wall 263 and the first casing section 224.

The other end of the core 262 is open and is provided with a groove or counterbore 272 which rotatably receives a circular cup-shaped spring housing 274, which opens axially outwardly and is closed by and secured to a plate 275, larger in diameter than the housing 274, which is suitably fixed to the second casing section 226. The housing 274 contains a clock spring 298 whose outer convolution is anchored to the sidewall 299 of the housing 274, as indicated at 204. The housing 274 has an axial tube 252 extending between and fixed to its end wall 253 and the plate 275, in line with an opening 255 in the end wall 253, to which the inner convolution of the spring 298 is anchored, as indicated at 278.

The tube 252 extends axially beyond the housing end wall 253 and is provided with a pair of diametrically opposed longitudinal slots 258 which open to the inner end of the tube. An axially elongated tubular pushbutton 288 is slidably engaged through the tube 252 and an opening 259 in the second casing section 226, and has a rounded and closed outer end 290. The pushbutton 288 is normally and yieldably held in its out position by a coil spring 289, under compression, engaged in the bore of the pushbutton, with its second end bearing against its closed outer end 290, and its first end bearing against end wall 263 of the rotor core 262, and circumsposed

on an axial pin 265 which is affixed to an extends inwardly from the end wall 263.

The push button 288 has a pair of diametrically opposed, radially outwardly extending detent arms 213, on its inner end, which have, at their free ends, laterally outwardly extending detent lugs 212, which are normally engaged with the leading sides 248 of pairs of diametrically opposed detent blocks 246 which project from the end wall 253 of the spring housing 274. Release of the rotor 260 to be turned in a cord reeling direction by the spring 298 is produced by pushing the pushbutton 288 inwardly from its out position, against the resistance of the spring 289, and disengagement of the detent lugs 212 from the detent blocks 246, for unreeling cord, is similarly enabled, as hereinabove described, in connection with the reel 20 of FIGURES 1 through 5.

The form of reel shown in FIGURE 11, and generally designated 320, is similar to the reel 220 of FIGURES 6 through 10, except that the tube 352, corresponding to the tube 252, has a closed inner end wall 353, against which the inner end of the spring 389 bears, under endwise compression. Operation of the pushbutton 388 produces the same results as hereinabove described.

The reel shown in FIGURES 12 through 14, and generally designated 420, has structure in common with the reels 220 and 320, as indicated by related numerals, and differs therefrom in not having a spring housing, and in the structure and relationship of its tube 452, pushbutton 488, and detent arms 413.

The rotor core 462 has a counterbore or groove 472, in its end adjacent to the second casing section 426, which rotatably receives the periphery of a circular pan-shaped journal 427 having an inner end wall 429 having an axial opening 431, which is in line with the bore 434 of an internal boss 432 on the second casing section 426. The clock spring 498 is located in the space between the first casing section 424 and the end wall 429 of the journal 427, and has its outer convolution anchored to the rotor core 462, as indicated at 404. The tube 452 extends through the center of the clock spring 493 and is anchored to the inner convolution thereof, as indicated at 478.

The tube 452 extends through the opening 431 of the journal end wall 429 and has a flared inner end 489 which is located at the outer side of the end wall 429. The boss 432 is formed with two diametrically opposed longitudinal slots 458, and the outer side of the end wall 429 has thereon a circle of spaced detent blocks 446.

The push button 488 is of dumbbell form and is composed of an outer section 489' and an inner section 491, which are spaced and connected by a reduced diameter axial rod 493. The adjacent ends of the sections 489' and 491 are rounded, as indicated at 495 and 497, respectively. A pair of diametrically opposed detent arms 413 are provided by an elongated leaf spring which has a central hub 499, provided with a hole 421 which passes the rod 493.

As shown in FIGURE 12, the detent arms 413 are normally bowed away from the outer side of the journal end wall 429 with their ends 415 engaged therewith and engaged with the leading sides of the detent blocks 446, and with the pushbutton 488 in its out position.

In order to disengage the detent arms 413 from the detent blocks 446, the pushbutton 488 is pushed inwardly, as shown in FIGURE 14, whereby the rounded end 495 of the outer section 489' of the pushbutton engages the hub 499 and pushes the hub into the flared end 489 of the tube 452, so that the detent arms 413 are bent outwardly away from the journal end wall and the ends of the detent arms 413 are withdrawn from the detent blocks 446.

The form of reel shown in FIGURE 15, and generally designated 520, is related in structure to the reel 20 of FIGURES 1 through 5 and the reel 420 of FIGURES 12 to 14, as indicated by related numerals. The reel 520

has a spherical casing 522, composed of first and second sections 524 and 526, in which a rotor 560, similar to rotor 60 of FIGURES 1 to 5 is journaled. The detent arrangement involves detent blocks 546 on the outer side of the second rotor end wall 510, but the boss 542 is different in form from the boss 42 of FIGURES 1 to 5 and the boss 442 of FIGURES 12 to 14. The boss 542 is cylindrical and has a reduced diameter terminal 543, on its inner end, which is engaged in the rotor core groove 568. The boss 542 is formed with diametrically opposed longitudinal slots 558, through which extend the resilient detent arms 513, radiating from an annular hub 599 which is circumposed on a reduced diameter rod 593 which spaces and connects the outer and inner sections 589' and 591 of a dumbbell shaped pushbutton 588, which works endwise through the axial bore 534 of the boss 542. The detent arms 513 are normally yieldably bowed away from the second end wall 510 of the rotor 560, with their ends engaged with the wall 510, behind the detent blocks 546, as shown in FIGURE 15. Pushing the pushbutton 588 inwardly engages the rounded inner end 595 of its outer section 589 with the hub 599 and forces the detent arms against the convex inner ends 589 of the slots 548, so that the detent arms 513 are moved outwardly away from the rotor and wall 510 and removed from the path of the detent blocks 546, as shown in FIGURE 14.

The rotor 560 is driven, in a cord winding direction, by a coil spring 598, whose first end is anchored, as indicated at 504 to the spindle 564 of the rotor, and whose second end is anchored to the boss 542, as indicated at 578. Operation of the pushbutton 588 is the same as for the hereinabove described reels.

Although there have been shown and described preferred forms of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

I claim:

1. A reel comprising a globular casing composed of mated first and second hemispherical sections, said first section having an internal boss having an inwardly opening axial socket having a bottom wall, said bottom wall being formed with an access opening, said second casing section having an internal boss having an axial socket opening outwardly through the second section and having a bottom wall formed with an axial opening, a pushbutton having a head slidably engaged in the second section socket and a reduced diameter ring extending inwardly from the head through the bottom wall opening and into the interior of the casing, said ring having diametrically opposed longitudinal slots, a diametrical pin extending across the ring and engaged in the slots, the bottom wall of the second section socket having outwardly opening notches in which the ends of the pin are movably engaged, a rotor having a tubular core having an internal groove at one end rotatably receiving the inner end of the ring, said core having a pintle on its other end journaled in the boss socket of the first casing section, said pintle having an enlarged diameter shoulder adapted to bear against the inner end of the first section boss, a resilient torsion member positioned in the bore of the core and secured at related ends to the core at its said other end and to said diametrical pin, said one end of the core of said rotor having circumferentially spaced detent lugs on its outer side, and circumferentially spaced detent blocks on the inner end of the second section boss located in the path of the detent lugs.

2. A reel according to claim 1, wherein said torsion member is a rubber band.

3. A reel comprising a globular casing composed of mated first and second hemispherical sections, said first section having an internal boss having an inwardly open-

ing axial socket having a bottom wall, said bottom wall being formed with an access opening, said second casing section having an internal boss having an axial socket opening outwardly through the second section and having a bottom wall formed with an axial opening, a push-button having a head slidably engaged in the second section socket and a reduced diameter ring extending inwardly from the head through the bottom wall opening and into the interior of the casing, said ring having diametrically opposed longitudinally slots, a diametrical pin extending across the ring and engaged in the slots, the bottom wall of the second section socket having outwardly opening notches in which the ends of the pin are movably engaged, a rotor having a tubular core having an internal groove at one end rotatably receiving the inner end of the ring, said core having a pintle on its other end journaled in the boss socket of the first casing section, said pintle having an enlarged diameter shoulder adapted to bear against the inner end of the first section boss, a resilient torsion member positioned in the bore of the core and secured at related ends to the core at its said other end and to said diametrical pin, one end of the core of said rotor having circumferentially spaced detent elements, and other detent elements mounted on the second section boss in the path of the rotor detent elements.

References Cited by the Examiner

UNITED STATES PATENTS

996,476	6/1911	Fitton et al.	242—107.6
1,084,960	1/1914	Randall	242—107.1
1,147,599	7/1915	Bordwell	242—100.1
1,186,131	6/1916	Replogle	242—100.1
1,415,489	5/1922	Simpson	242—107.6
1,466,374	8/1923	Hart	242—107.6
1,692,517	11/1928	Replogle	242—100.1
2,037,324	4/1936	Heusinkveld et al. ..	242—107.11
2,926,865	3/1960	Humphrey	242—107.13
3,084,886	4/1963	Bastow	242—107.6

FOREIGN PATENTS

762,989 2/1934 France.

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