June 23, 1953 E. W. FISHBURNE 2,642,698

TETHERED HELICOPTER TOP

Filed May 17, 1948 2 Sheets-Sheet 1

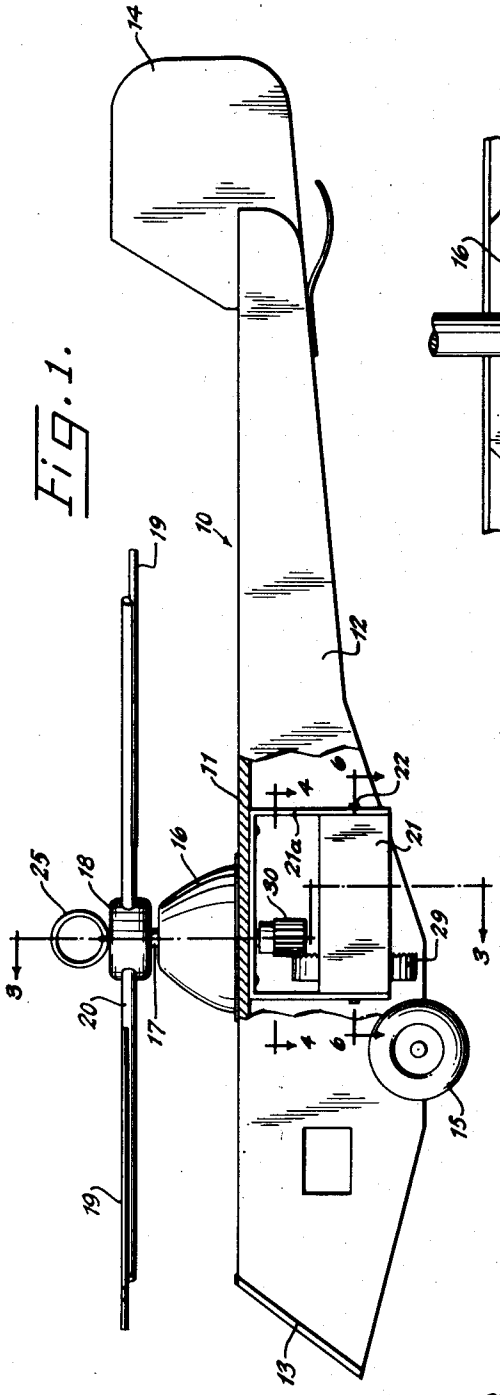


Fig. 1.

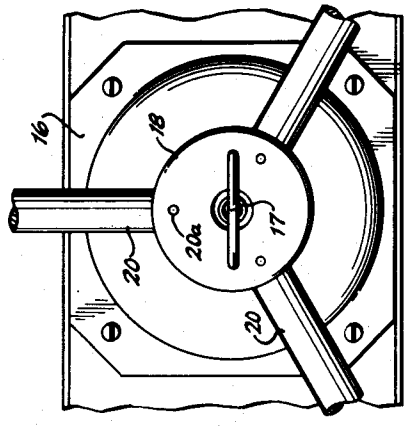


Fig. 2.

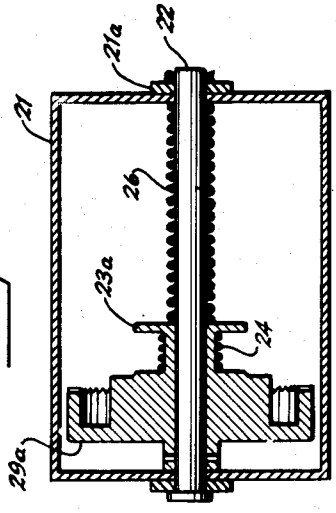


Fig. 7.

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June 23, 1953 E. W. FISHBURNE 2,642,698

TETHERED HELICOPTER TOP

Filed May 17, 1948 2 Sheets-Sheet 2

Fig. 3.

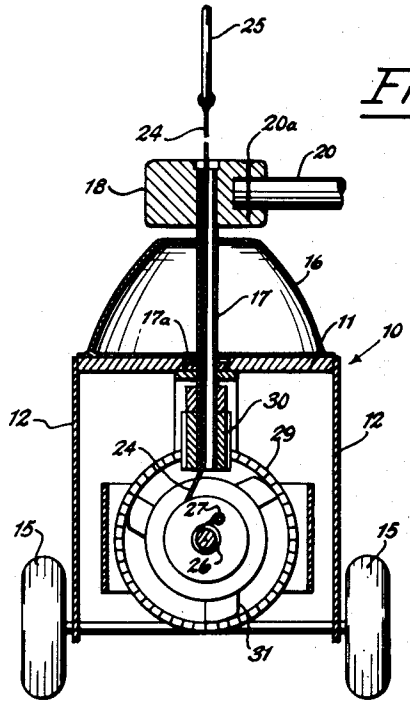


Fig. 6.

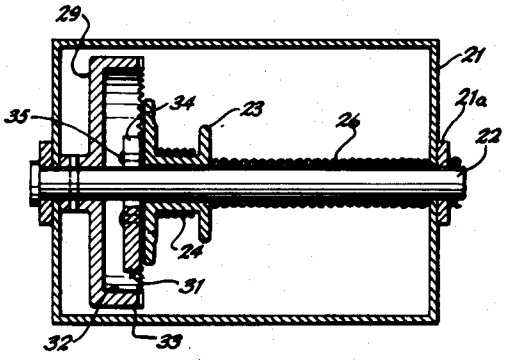


Fig. 4.

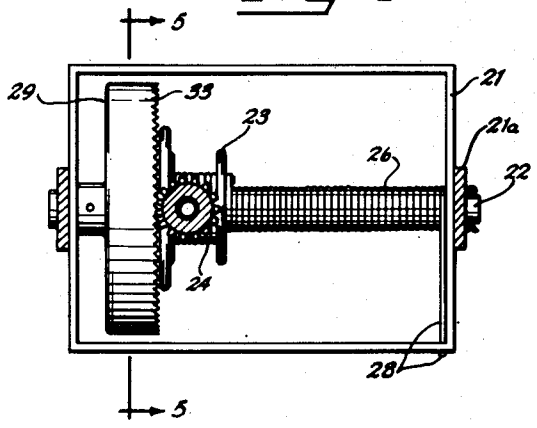
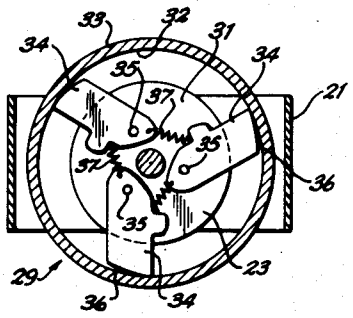


Fig. 5.



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TETHERED HELICOPTER TOP

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Application May 17, 1948, Serial No. 27,431

1 Claim. (Cl. 46—61)

1

This invention relates to a toy helicopter or the like comprising a simulated airplane fuselage with a helicopter upright propeller rotatable in a horizontal plane above the fuselage and operating means for rotating the propeller including a suspending cord which passes through a vertical tubular shaft for the propeller to operating means therefor within the fuselage.

In addition to the above, as the primary purpose of the invention, the invention has for a further object to provide a simple operating means comprising a spring returned rotatable drum upon which the operating cord is rewound through the action of the spring and a driving connection between the drum and propeller shaft including a flywheel or the like having a geared drive with the propeller shaft whereby the propeller will be rotated by the turning of the flywheel.

Another object of the invention is to provide a one-way clutch between the drum and flywheel whereby the operating cord may be rewound on the drum while the flywheel and propeller continue to rotate. Thus by an up and down movement of the upper free end of the operating cord the toy helicopter may be suspended and its propeller caused to turn and a turning movement of the assembly on the cord is also effected with a pleasing operation of the assembly. In the absence of the one way clutch rotation of the propeller may be had by a direct connection between the drum and flywheel directly following the turning movements of the drum, thereby providing an assembly which is less expensive to produce and yet having movements similar to the assembly with a clutch and also reverse rotation of the propeller.

It will be seen that the operating mechanism is most simple for rotating propellers attached to upright tubular shafts of a toy helicopter, rotating wheels, disks and the like in a horizontal plane attached to other simulating bodies.

Other objects and details of highly satisfactory embodiments of my invention will appear in the following specification in conjunction with the accompanying drawings forming a part thereof.

In the drawings:

Fig. 1 is a side elevation of a toy helicopter embodiment of my invention with a portion broken away to show the propeller operating mechanism.

Fig. 2 is an enlarged fragmentary plan view thereof.

Fig. 3 is a transverse sectional view thereof taken on line 3—3 of Fig. 1.

2

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a vertical sectional view taken on line 5—5 of Fig. 4.

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 1, and

Fig. 7 is a transverse sectional view similar to Fig. 6, but illustrating a modified form of drive for the helicopter propeller.

Referring to the drawings, in general the toy helicopter in accordance with my invention comprises a body portion 10, constructed of a top member 11, of wood or plastic with sides 12 and a front end 13 of thin material such as aluminum and a similar tail 14 mounted on a pair of wheels 15 and fantastically simulating an airplane fuselage and equipment. The top 11 carries a dome shaped mounting 16 providing an upper bearing for an upright tubular propeller shaft 17 on which a hub 18 is mounted carrying a propeller comprising three blades 19 the ends 20 of which are mounted in sockets formed in hub 18 and secured therein by appropriate pins 20a.

Within the fuselage is a frame structure 21 preferably of rectangular conformation supported by the under side of top 11 by a bracket frame structure 21a so as to extend lengthwise of the fuselage interior and providing a support and end bearings for a drive shaft 22. The upper portion of bracket frame structure 21a provides a lower bearing for propeller shaft 17 and a support therefor, engaged by a collar or the like 17a on the shaft, and the upper end of a pinion gear 30, below bracket 21a, with this collar, prevents axial movement of the shaft.

Shaft 22 provides a journal for a drum 23 in direct alignment under the tubular propeller shaft 17 which affords a passageway for an operating cord 24 normally fully wound on the drum with its outer end secured to a ring 25 which prevents it from being drawn entirely through shaft 17 and provides a handle for manipulating the toy. A helically wound spring 26 surrounding drive shaft 22 having one end secured to a pin 27 to the flange 23a of the drum 23 and its other end 28 secured by engagement with a side of frame structure 21 affords a tension on drum 23 for winding operating cord 24 thereon but yields to allow it to unwind when ring 25 is raised by a finger of an operator of the toy, the spring 26 yielding under the weight of the helicopter structure. Spring 26 also operates on drum 23, which is loose on drive shaft 22, to hold it in its proper operating position on drive shaft 22 with respect to a gear drive wheel 29 on

the shaft adjacent to propeller shaft 17. Drive wheel 29 is preferably rather heavy, providing a flywheel, which is secured to shaft 22 to rotate therewith.

In a simplified construction of my toy helicopter, drum 23a may be secured directly to wheel 29a or formed integrally therewith as shown in Fig. 7. In either case the wheel 29 or 29a, has laterally extending peripheral gear teeth which drivingly engage the pinion gear 30 on the lower end of tubular propeller shaft 17 so as to rotate the same in accordance with the wheel 29 or 29a in turning.

In the arrangement shown in Fig. 7, wheel 29a is subject to rotation in either direction following the rotation of drum 23a and the propeller blades will rotate accordingly. However, in the preferred arrangement as shown particularly in Figs. 5 and 6 where drum 23 rotates on the drive shaft 22, drum 23 is provided with a clutch 31 engageable with the inner cylindrical surface 32 of the rim 33 of wheel 29 engageable therewith for rotating the wheel in one direction when the operating cord is drawn from the drum and releasing therefrom to permit drum 23 to rewind the operating cord.

Clutch 31 comprises a plurality, three being shown, of arms 34 having their inner ends mounted on pivot bearings 35 carried by the flange 23b of drum 23 facing wheel 29, and extending therefrom angularly with respect to radial lines of wheel 29. The outer ends 36 of these arms are of arcuate formation for engaging the inner cylindrical surface 32 of the rim of wheel 29. Springs 37 bearing between the inner ends of arms 34 and under sides of the next adjacent arms respectively yieldingly maintain the arcuate ends 36 thereof in engagement with the cylindrical clutch surface 32 of wheel 29. It will be seen that when operating cord 24 is drawn to rotate drum 23 the ends 36 of arms 34 will be forced into tight engagement with the surface 32 of wheel 29 and cause it to rotate with the drum but when drum spring 26 operates drum 23 to rewind cord 24 the engagement of ends 36 of these arms with the clutch surface of wheel 29 is released and they slide with respect thereto when the drum is rotated in the direction opposite to that in which the flywheel 29 is rotating.

In this way flywheel 29, the parts driven thereby, and the helicopter propeller may be continuously rotated, giving the operating cord 24 a series of up and down movements, rather quickly in the down movements, the flywheel 29 being maintained in continuous rotation. This operation effects a continuous rotation of the helicopter propeller and rather interesting resultant relatively slow turning movements of the entire toy helicopter with respect to the operating cord on which it is suspended.

Having described a highly satisfactory embodiment of my invention in the form of a toy helicopter it is not desired to limit the scope of my invention to the exact embodiment or details as set forth.

What I claim as my invention and desire to secure by Letters Patent is:

In a toy helicopter, a hollow body, a hollow shaft rising from within said body, a propeller mounted on the upper end of said shaft, a pinion mounted on the lower end of said shaft within the body, a second shaft journalled horizontally within said body, a flywheel keyed on said second shaft, an annular flange on one side of said flywheel and having its free edge toothed and engaged with said pinion, a drum loosely mounted on said second shaft and including end flanges, a series of clutch arms pivoted on the outer side of one of the flanges of said drum for cooperation with the inner surface of the flange of said flywheel so transmit motion from said second shaft to said hollow shaft and the propeller, retractile springs interconnecting said clutch arms to normally hold the same lightly in engagement with the flange of said flywheel, a coil spring on said second shaft having one end secured to said body and its other end secured to the other of the flanges of said drum, a cord normally wound on said drum and having one end attached thereto and its other end passing upwardly through said hollow shaft, and means at the free end of said cord facilitating holding the cord to suspend the helicopter so that its weight will act to cause the cord to unwind from said drum and, at the same time, to place said coil spring under tension to affect the rewinding of the cord on the drum.

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