United States Patent [19]

Meyer

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[45] **May 8, 1973**

[54] TOY AIRCRAFT AND CONTROL THEREFOR

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[52] **U.S. Cl.** ..... **46/77**, 46/243 AV

[51] **Int. Cl.** **A63h**

[58] **Field of Search** ..... 46/77, 78, 74, 243; 272/31 A, 31 B

[56] **References Cited**

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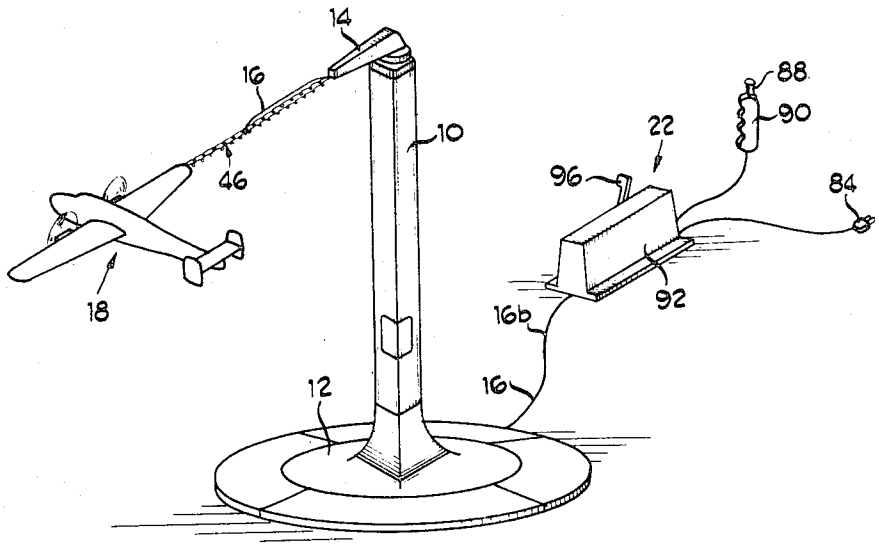
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[57] **ABSTRACT**

An amusement device which includes a craft, such as a model airplane, attached by a power cable and a tethering line to a control means which includes an upright generally hollow support pylon for tethered "-flying" of the craft about the pylon. The tethering line is threaded for free movement through the hollow pylon, extends from the top thereof for connection to the craft, and extends from the bottom thereof for manipulation whereby the flight of the craft may be controlled simply by pulling in or paying out the tethering line. In one embodiment of the invention a motor in the craft is connected through the power cable to battery type power means in the pylon. A switch for the power means is operatively associated with the tethering line and is actuated as a function of the amount of tension in the line. The motor is removably mounted in a recess on the exterior of the craft and a power plug is connected to the end of the power cable and is removably received in a socket on the craft. A reel type assembly is provided for paying out and reeling in the tethering line. The assembly has a single lever and control handle arrangement for controlling both the speed of the craft motor and the paying out and reeling in of the tethering line. Lost motion means is provided in the connection between the lever and the reel to prevent entanglement of the line on the reel during rapid paying out of the line. The reel itself has a double core to provide space between the cores for excess tethering line to further prevent entanglement thereof on the reel.

25 Claims, 13 Drawing Figures



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Fig 1

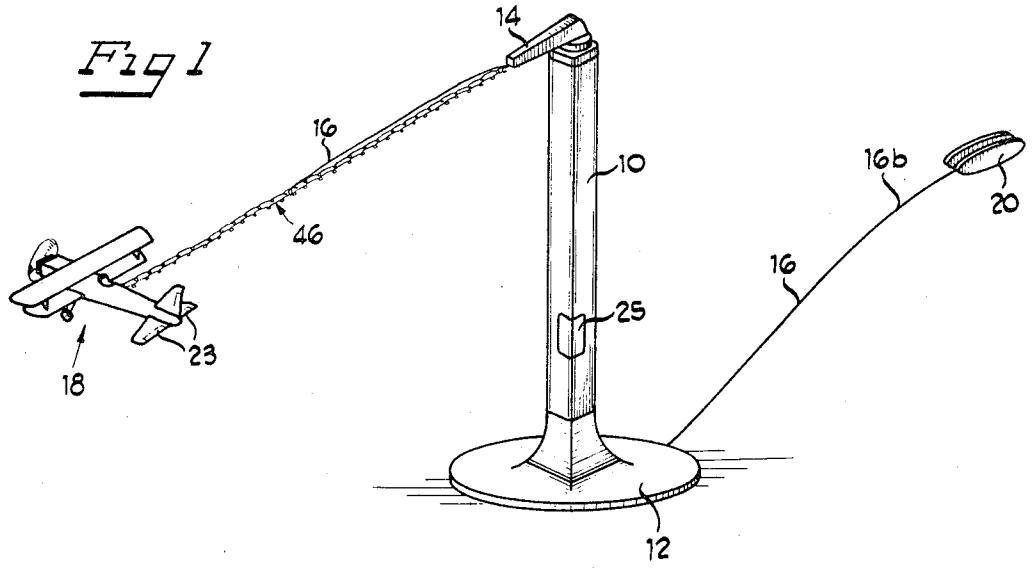


Fig 7

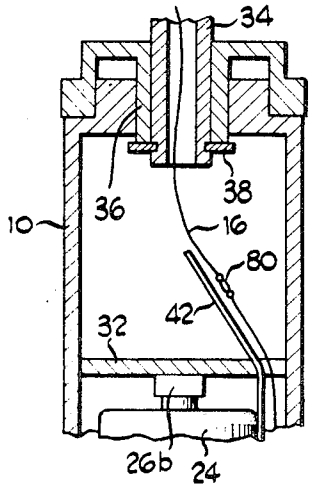
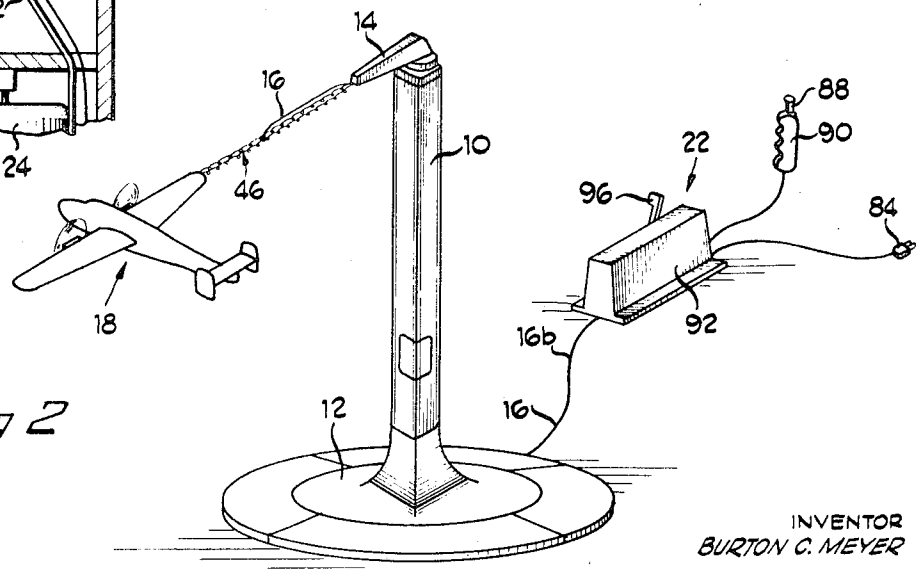


Fig 2



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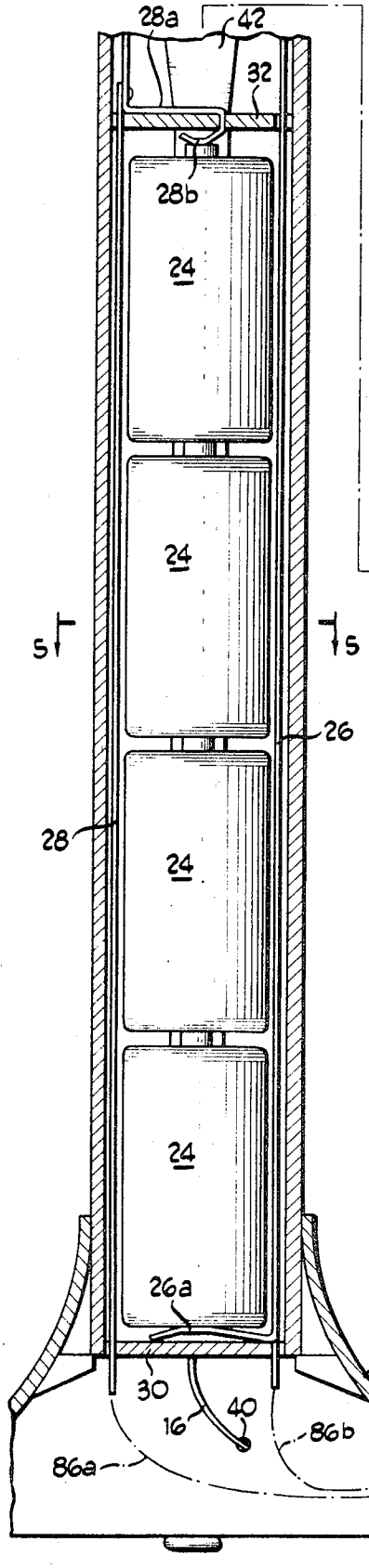


Fig 3

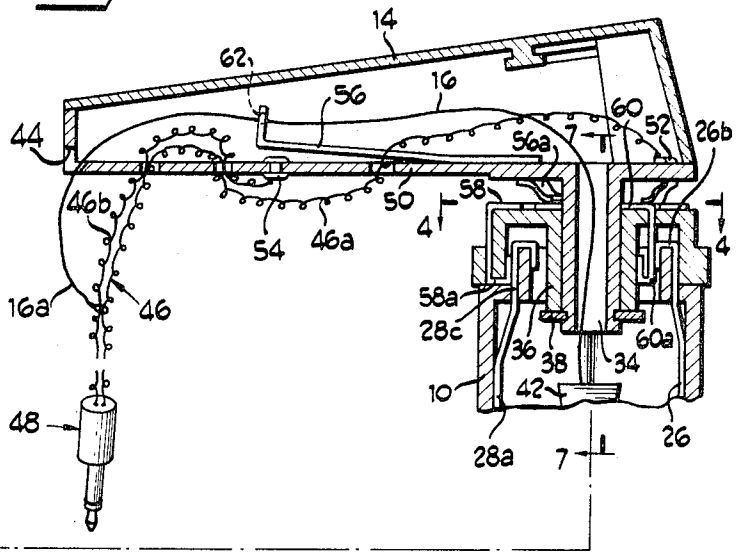


Fig 4

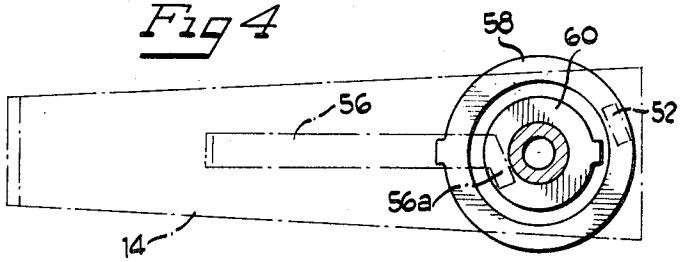
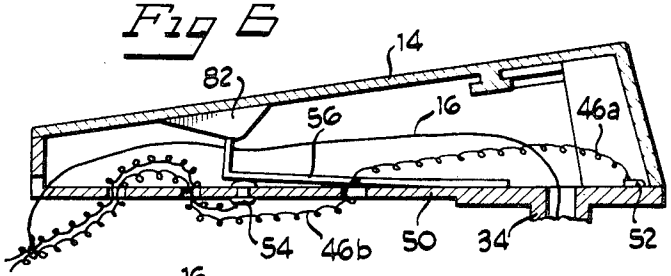


Fig 6



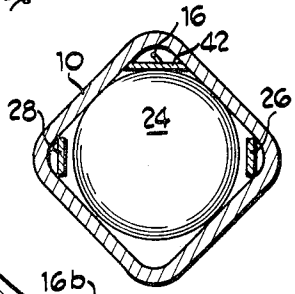


Fig 5

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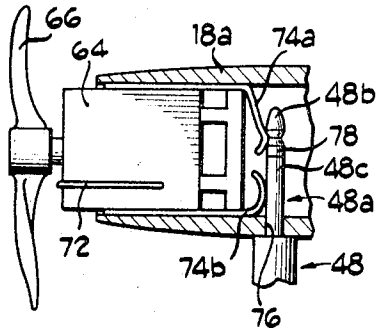


Fig 12

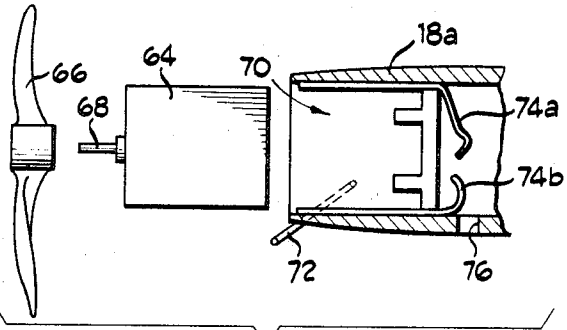


Fig 11

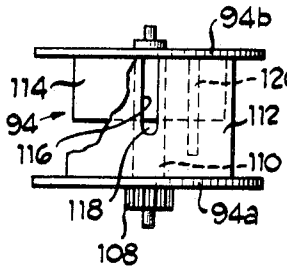


Fig 13

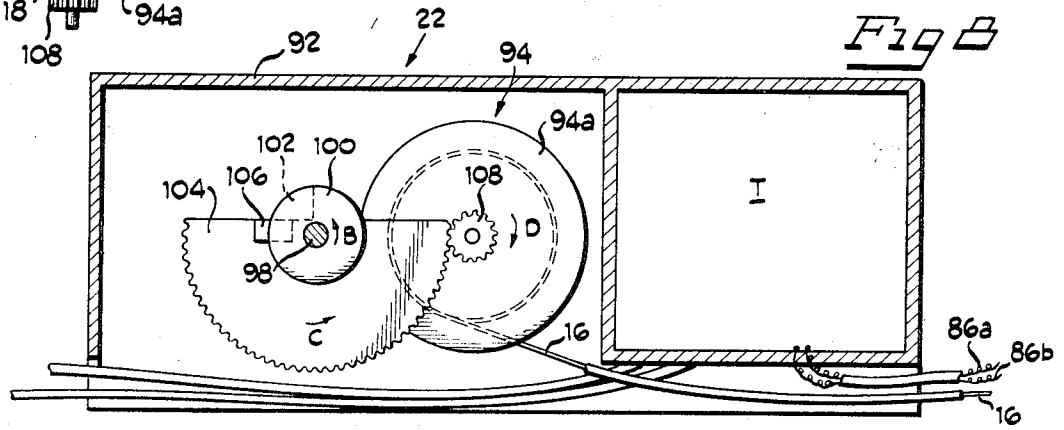


Fig 8

Fig 9

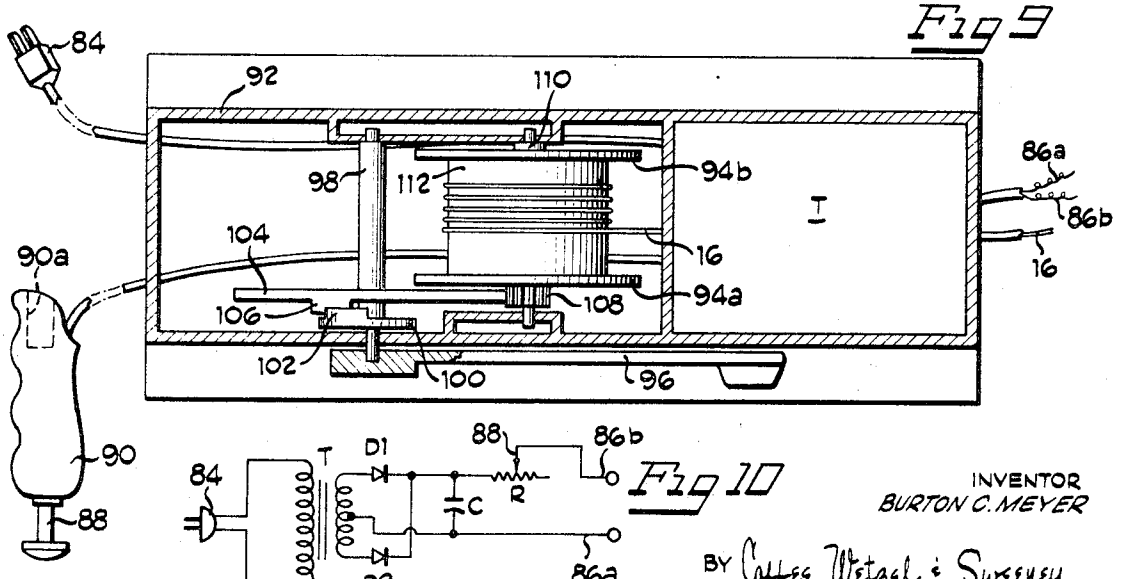


Fig 10

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TOY AIRCRAFT AND CONTROL THEREFOR

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a toy or amusement device and more particularly relates to a tethered craft, such as a model airplane, which is controlled by a power cable and a tethering line both secured to the craft and to a control means which includes an upright support pylon.

Prior aircraft or airplanes of the power driven type have been capable of sustained flight and commonly are tethered by means of a power cable and/or a tethering line secured at one end to the craft, with the opposite end, in effect, being held and controlled by the operator through a control mechanism to cause the craft to fly in closed circles. The present invention is directed to such toys or amusement devices and has for one of its objects the provision of a new and improved pylon type controlled tethered airplane, or the like, wherein the airplane is rotated in an orbit about the pylon. The orbit can be increased or decreased in diameter.

Another object of the invention is to provide an improved control means in which the airplane is power rotated and the speed can be controlled readily during the paying out or reeling in of the tethering line.

The present invention contemplates the provision of a powered, tethered craft, such as an airplane, or the like, for tethered "flying" about an upright support pylon which, in one form of the invention, has a plurality of batteries providing the power means for the plane. A tethering line is threaded through a guide channel within the pylon, alongside the batteries, for free movement through the pylon. The tethering line extends from the top of the pylon for connection to the craft and from the bottom of the pylon for grasping and/or manipulation by an operator so that the flight of the airplane may be changed by pulling in or paying out of the tethering line for tethered flying about the pylon. A motor is disposed on the craft and is operatively connected to the batteries in the pylon by a power cable extending along the tethering line. A switch is provided to activate and deactivate the battery-type power means and the switch is operatively associated with the tethering line and actuated as a function of the amount of tension in the tethering line.

In the preferred embodiment of the invention the switch means is held closed to activate the power to the craft's motor when tension is maintained in the tethering line and is opened when the tension is released. The relative lengths of the tethering line and the power cable are such that the outer limit of flight of the craft is determined by the length of the power cable so that the switch may be opened when the craft is at its outer limit of flight simply by releasing the tension in the tethering line.

The motor is readily removably mounted in a recess on the exterior of the airplane, preferably at the nose thereof, to permit easy replacement or provide for interchangeability of the motor without dismantling the craft itself. A latch releasably holds the motor in the recess. A power plug is connected to the power cable on the outer end thereof and is removably received in a socket on the airplane, the power plug having contacts which operatively engage contacts associated with the motor.

The device of the present invention also includes a new and improved assembly for paying out and reeling in the tethering line. The assembly includes a rotatably mounted reel and a control lever for rotating the reel by manual manipulation of the lever to pay out and reel in the tethering line. Movement of the lever in one direction permits the reel to rotate to pay out tethering line for the airplane and movement of the lever in an opposite direction rotates the reel to wind the tethering line onto the reel. A lost motion connection is provided between the lever and the rotating reel whereby movement of the lever in said one direction does not positively drive the reel but permits the craft to pull the tethering line from the reel due to the centrifugal force of the craft flying about the pylon, thereby preventing entanglement OF the line on the reel by paying out more line than the flight of the aircraft will take, as has been heretofore prevalent. The reel itself has a double core construction, with an inner core and an outer core. The outer core is superimposed over the inner core and is of a larger diameter than the inner core so as to define space between the cores in which excess portions of the tethering line may be wound on the inner core. The double core construction provides a place to "store" excess tethering line, as hereinafter described, and thereby further prevents entanglement of the line on the reel.

Yet a further feature of the invention is the provision of an A.C. connection for the device, including a manipulatable speed control handle removably mounted on the end of the reel control lever whereby both the speed of the airplane motor and the paying out and reeling in of the tethering line may be accomplished by grasping the handle and manipulating the handle and the lever.

Other objects, features and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one form of the amusement device of the present invention which is battery operated and wherein the tethering line is manually payed out and pulled in to control the diameter of the orbit in which the airplane rotates about the pylon;

FIG. 2 is a modified form of the invention in which the airplane is powered by A.C. current and wherein a reel and lever assembly is provided for paying out and reeling in the tethering line to the airplane;

FIG. 3 is a vertical, generally central, section through the pylon and rotating arm structure of FIG. 1, partially broken away, and with the top of the pylon on which the rotating arm is mounted shown broken away and disposed to the right as viewed in FIG. 3;

FIG. 4 is a top plan view of the ring contacts disposed at the top of the pylon, with the operating arm and complementary contacts on the arm shown in phantom;

FIG. 5 is a horizontal section taken generally along the line 5—5 of FIG. 3;

FIG. 6 is a vertical section similar to that of the right-hand portion of FIG. 3, but through the rotating arm of the embodiment of the invention shown in FIG. 2;

FIG. 7 is a broken away vertical section taken generally along the line 7—7 of FIG. 3;

FIG. 8 is a vertical longitudinal section through the reel and lever assembly shown to the right in FIG. 2;

FIG. 9 is a horizontal section through the reel and lever assembly of FIG. 8;

FIG. 10 is a wiring diagram of a type of circuitry utilized with the device of the present invention for adaptation to A.C. current;

FIG. 11 is a vertical section through the nose of an airplane of the present invention, with the motor and propeller thereof removed therefrom and shown in exploded view;

FIG. 12 is a view similar to that of FIG. 11, with the motor and propeller seated and latched in the recess in the nose of the airplane, with the removable power plug inserted into the socket on the underside of the airplane nose; and

FIG. 13 is a view of the double core reel, partially broken away, utilized with the reel assembly shown in FIGS. 8 and 9.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in greater detail, FIGS. 1 and 2 show two embodiments of the invention adapted for utilizing direct and alternating current, respectively. Both embodiments include an upright support pylon **10** having a generally flat base portion **12** at the bottom thereof and an arm **14** extending horizontally from the top thereof, the arm being pivoted to the top of the pylon for full 360° rotation thereabout. As will be described in greater detail hereinafter, the upright support pylon **10** is generally hollow and a tethering line **16** is threaded through the pylon for free movement relative thereto, thereby providing easy control of a craft simply by pulling in or paying out the tethering line. The "outer end" **16***a* of the tethering line **16** is secured to a craft, such as a model airplane, generally designated **18**, for tethered "flying" of the airplane about the pylon **10**. The "inner end" **16***b* of the tethering line **16** extends from the bottom of the pylon **10** for manipulation by an operator of the device. As is known, as the airplane is powered in tethered "flight," the orbit of the airplane about the pylon **10** can be increased or decreased in diameter by pulling in or paying out the tethering line.

Since the pylon of the present invention is generally hollow, the pulling in or paying out of the tethering line **16** is accomplished simply by manipulation of the inner end **16***b* of the tethering line. In the embodiment of the invention shown in FIG. 1, this manipulation is afforded simply by providing a handle **20** on the inner end of the tethering line for manual grasping by the operator who controls the orbit of the airplane by pulling on or releasing the tension in the tethering line. Pulling on the line will decrease the diameter of the airplane's orbit and releasing the line will permit the centrifugal force of the airplane to pull on the line and increase the orbit of flight. In the embodiment of the invention shown in FIG. 2, a reel and lever assembly, generally designated **22**, is provided for manual control to reel in or pay out the tethering line **16**.

Preferably, the tethering line is sufficiently long so that the inner end **16***b* thereof extends beyond the maximum orbit of the airplane **18** so that the operator may position himself completely beyond the airplane's path of circular flight while manipulating the craft.

The airplane may be provided with adjustable elevators **23** (FIG. 1). At a constant speed and orbital diameter, a higher and slower flight is effected with the elevators up, and a lower and faster flight is effected with the elevators down.

Reference now will be made to FIGS. 3 through 5 and particularly the adaptation of the invention for use with direct current (i.e., battery operated). Referring to FIG. 3, the generally hollow support pylon **10** houses a plurality of batteries **24** stacked end to end in the upright pylon. An access door **25** (FIG. 1) is provided to replace the batteries **24**. Within the pylon is mounted a pair of contact strips **26** and **28** which engage the bottom and top of the stack of batteries **24**, respectively. More particularly, the contact strip **26** which extends generally the entire length of the upright pylon has a lower lip **26***a* which is sandwiched between a bottom wall **30** of the pylon and the bottom of the lowermost battery in the stack thereof. The contact strip **26** extends upwardly along the inside of the pylon and terminates at the top thereof in an inwardly turned hook portion **26***b* (see the top right-hand portion of FIG. 3). The other contact strip **28** also extends generally along the entire length of the pylon **10** on the inside thereof and is secured to an L-shaped contact leaf **28***a* which extends at its lower end through an upper wall **32** of the pylon for contact with the top of the uppermost battery in the stack thereof, as at **28***b*. The L-shaped contact leaf extends upwardly and terminates in a hook portion **28***c* (see the right-hand portion of FIG. 3).

Referring particularly to the right of FIG. 3, the rotating arm **14** which extends radially outwardly of and is pivoted to the top of the pylon **10** is generally hollow and includes a downwardly extending hollow pivot shaft **34** which is journalled in a bushing member **36** at the top of the pylon **10**. The arm pivot shaft **34** is fixed vertically relative to the bushing member **36** by a key **38**. The tethering line **16** extends from its inner end **16***b* (see the bottom of FIG. 3) through an aperture **40** in the base **12** of the pylon **10** upwardly through a guide channel in the generally hollow pylon defined by an inner wall of the pylon and a guiding strip **42** (see FIG. 5). The tethering line passes through the top of the pylon, through the hollow pivot shaft **34** and into the hollow pivot arm **14**, as best seen at the top right-hand portion of FIG. 3. The tethering line is threaded through the hollow pivot arm **14** and through an aperture **44** on the outer end of the pivot arm for connection either directly to the flying craft or airplane **18** or for connection to the outer end of a power cable, generally designated **46**.

The power cable **46** comprises two conductive wires **46***a* and **46***b* which are connected at their outer ends to a power plug, generally designated **48**. Wire **46***a* of the power cable **46** extends through the lower wall **50** of the rotating arm **14** and is secured to a contact leaf **52** which is conductively connected to the batteries **24**, as described hereinafter. The other wire **46***b* of the power cable **46** also extends into the hollow arm **14** and is secured to a switch button **54** which comprises one part of a switch means in the circuit from the batteries **24** to the airplane. The other part of the switch means comprises a switch arm **56** which has a contact leaf **56***a* which, like the contact leaf **52**, is in conductive association with the batteries **24**.

In particular, and referring to FIGS. 3 and 4, an outer contact ring 58 and an inner contact ring 60 are mounted on top of the bushing member 36 on top of the pylon 10. The outer contact ring 58 has a downwardly depending hook portion 58*a* which engages the upper hook portion 28*c* of the contact leaf 28*a* (which, in turn, engages the top of the stack of batteries 24). The outer contact leaf 58 also engages the contact leaf 52 which is secured to the wire 46*a* of the power cable 46 (see FIG. 4). The inner contact ring 60 has a downwardly depending hook portion 60*a* (FIG. 3) which engages the upper hook portion 26*b* of the contact strip 26 (which, in turn, engages the bottom of the stack of batteries 24). Again as seen in FIG. 4, the inner contact ring 60 engages the contact leaf 56*a* on the inner end of the switch arm 56 which makes or breaks the circuit by contact with the switch button 54 which is secured to the wire 46*b* of the power cable 46. As is known, the contact rings 58, 60 have a "brushing" engagement with the contact leafs 52 and 56a so that the arm 14 may rotate about the top of the pylon 10 without breaking the circuit between the power plug 48 and the batteries 24.

As seen best at the top of FIG. 3, the tethering line 16 extends through an aperture 62 in the switch arm 56. Thus, it is apparent that since the tethering line 16 enters the bottom of the rotating arm 14 through the hollow pivot shaft 34 and leaves the rotating arm 14 through the aperture 44, which is also at the bottom of the arm, tension in the tethering cable will urge the switch arm 56 downwardly into engagement with the switch button 54 to complete the circuit as described above. In other words, the switch means (54, 56) to activate and deactivate the power means of the device (the batteries 24) is operatively associated with the tethering line 16 and actuated as a function of the amount of tension in the tethering line. Tension in the tethering line closes the circuit. The circuit is open when the tension is released. The tension in the tethering line normally is provided by the centrifugal force resulting from the flight of the airplane 18. With the power cable 46 connected to the airplane, through the power plug 48, and also fixed to the rotating arm 14, the outer limit of flight of the airplane is determined by the length of the power cable 46. Thus, if there is sufficient slack in the tethering line 16, the switch means may be opened when the airplane is at its maximum orbit of flight simply by releasing the tension in the tethering line 16.

Referring to FIGS. 11 and 12, a motor 64, which has a propeller 66 secured to a rotating shaft 68, is removably mounted in a recess, generally designated 70, in the nose portion 18*a* of the airplane 18. A latch member 72 is pivoted on opposite sides of the nose of the airplane and is movable from its position shown in FIG. 11 to its position shown in FIG. 12 to hold the motor 64 in the recess 70 in operative position. A pair of contacts 74*a* and 74*b* are operatively engageable with the motor 64. As seen in FIG. 12, the power plug 48 has a rod portion, generally designated 48*a*, which is received in a socket or aperture 76 through the bottom of the nose portion 18*a* of the airplane. The rod portion 48*a* of the power plug 48 has contact portions 48*b* and 48*c* which make contact with the motor contacts 74*a* and 74*b*, respectively, when the power plug is properly positioned in the nose of the airplane. The contact portions 48*b* and 48*c* of the power plug are separated by an insulator member 78. Thus, the power circuit described above, through the power plug 48, drives the motor 64, through the contacts 74*a*, 74*b*. With the power plug 48 and the motor 64 removably mounted on the nose of the airplane, a wide variety of flying crafts and/or flying characteristics of an individual craft is made available by the present invention. Different types of crafts may be utilized with the same pylon and control arrangement simply by unplugging the power plug 48 from one craft and inserting it into a different craft. In addition, the motor 64 may be replaced if defective, or interchangeable motors having different power characteristics may be utilized with the same type of craft.

Before describing the utilization of alternating current with the present invention, it should be pointed out that, preferably, a swivel device 80 (FIG. 7) is employed appropriately in the tethering line 16 to prevent the line from twisting or knotting. In addition, as seen in FIG. 7, the guide strip 42 is flared inwardly at its upper end so as to provide a smooth, continuous guide channel through the pylon in which the tethering line 16 is threaded for free movement through the pylon as the line is pulled in or payed out.

The structure as described above is readily adaptable for utilizing A.C. current rather than the batteries 24. In doing so, as seen at the bottom of FIG. 3, the contact strips 26 and 28 are elongated at their lower ends for connection to wiring which is shown in phantom. In addition, with reference to FIG. 6, the rotating arm 14 may be modified to include a lug 82 on the inside of the top wall thereof to hold the switch arm 56 and switch button 54 in contact. Other switching means or speed control means, as hereinafter described, may be employed exteriorly of the pylon structure for controlling the power to the airplane motor 64.

FIG. 10 shows one type of circuitry which may be employed to utilize A.C. current with the device of the present invention. A plug 84 is provided for connection to an appropriate source of A.C. current, and a step-down transformer T is employed to reduce the voltage of the alternating current source. A pair of diodes D1 and D2 and a capacitor C are appropriately used in the circuit. In order to control the speed of the airplane by controlling the current thereto, a rheostat R or other variable resistance means is employed in the circuit. Lead wires 86*a* and 86*b* are connected to the contact strips 28 and 26, respectively, as seen at the bottom of FIG. 3. As seen in FIGS. 2 and 9, a button 88 (also see FIG. 10) may be mounted on a speed control handle 90 for controlling the rheostat R.

FIGS. 8 and 9 show the reel and lever assembly 22 for paying out and reeling in the tethering line 16. The assembly includes a housing 92 within which is rotatably mounted a reel, generally designated 94, on which the tethering line is wound. A control lever 96, through lost motion means described in greater detail hereinafter, is operatively connected to the reel 94 so that movement of the lever in one direction permits the reel to rotate to pay out the tethering line 16 but does not positively rotate the reel when moved in said one direction. Movement of the lever in an opposite direction positively rotates the reel to wind the tethering line onto the reel. In other words, movement of the lever in said one direction, because of the lost motion

connection, does not positively drive the reel but permits the airplane 18 to pull the tethering line from the reel due to the centrifugal force of the airplane, thereby preventing entanglement of the line on the reel should the lever 96 be moved at a rate to pay out the tethering line faster than it will be taken up by the pull from the airplane. More particularly, the lever 96 is fixed to a shaft 98 rotatably journalled in the housing 92. A disc member 100 is fixed to the shaft 98 for rotation therewith and includes an inwardly axially protruding lug 102 on the disc and spaced from the shaft 98. A segmented gear member 104 is mounted on the shaft 98 for rotation relative thereto but fixed axially thereof. More particularly, the gear 104 is prevented from moving in one direction by the disc 100 which is fixed to the shaft and in the opposite direction by an end disc 94*a* of the reel 94. The gear member 104 has an axially protruding lug 106 spaced from the shaft member and extending into the path of rotation of the lug 102 on the disc member 100. A second gear member 108 is fixed to the reel 94 on the outside face of the end disc 94*a* for rotation therewith about the axis of the reel and is in mesh with the segmented gear member 104 mounted on the lever shaft 98. With the structure, upward movement of the lever 96, as viewed in FIG. 9, rotates the disc member 100 in the direction of arrow B (FIG. 8) causing the lug 102 on the disc to engage the lug 106 on the segmented gear 104 and thereby cause the segmented gear to rotate in the direction of arrow C. With the segmented gear 104 meshed with the reel gear 108, rotation of the segmented gear 104 in the direction of arrow C will cause the reel to rotate in the direction of arrow D and reel in the tethering line 16. In other words, movement of the lever 96 in the aforementioned direction positively drives the reel 94 to pull in the tethering line and, normally, the line will not become entangled on the reel regardless of the speed by which the lever is moved in the aforesaid direction. However, should the lever 96 be moved in the opposite direction (i.e., to cause the disc 100 to move opposite the direction of arrow B) at a fast rate, the lug 102 on the disc 100 simply would "leave" the lug 106 on the segmented gear 104 creating a lost motion action whereby the tethering line 16 will be pulled from the reel due to the centrifugal force of the airplane as the lug 106 catches up to the lug 102.

As a further feature of the invention, the speed control handle 90 has a recess 90a in the base thereof for positioning over the outer end of the lever 96 so that both the speed of the airplane motor 64 and the paying out and reeling in of the tethering line 16 may be accomplished by grasping the speed control handle 90 and manipulating the rheostat button 88 while at the same time manipulating the lever 96.

It also should be pointed out that the housing 92 of the reel assembly may be utilized to house the transformer T and related circuit components, as seen in FIGS. 8 and 9, with the the lead wires to the plug 84 and the speed control handle 90 extending through the housing 92, as seen in FIG. 9.

FIG. 13 shows in detail the structure of the reel 94, The reel has a double core construction which provides means for "storing" excess tethering line which is not necessary for controlling the flight of the airplane 18 which is governed, in part, by the length of the power cable 46. Such excess line on the reel could tend to cause entanglements in the line. The reel includes an inner core 110 which defines the shaft for the reel. An outer core 112 in the form of a cup-like shell is fixed to the end disc 94*a* of the reel. The opposite end disc 94*b* of the reel is fixed to a cup-like member 114 which is telescoped within the outer core 112 and held in such relationship by a press fit, with the inner core 110 extending through the end disc 94*b*. A slot 116 is formed in the outer core 112 and is open at the end of the core opposite the end disc 94*a*. The slot is longer than the width of the cup-like member 114 so that an aperture 118 is formed through which the tethering line may extend from the inner core to the exterior of the reel. A rod 120 is fixed to the end disc 94*b* and extends into the space between the inner core 110 and the inside of the outer core 112 so that relative rotation between the end disc 94*a* and the end disc 94*b* will cause the pin 120 to engage the tethering line extending through the aperture 118 and between the two cores and cause the tethering line to be wound onto the inner core 110. Of course, such relative rotation in the opposite direction would permit the tethering line to be pulled off of the inner core. Once the desired amount of tethering line is wound onto the inner core 110, the components of the reel (i.e., the end disc 94*a* and the outer core 112 and inner core 110 fixed thereto, and the end disc 94*b* and the cup-like member 114 fixed thereto) will rotate together as a unit during the normal operation of the device in paying out and reeling in the tethering line.

With the device of the present invention, paying out and reeling in of the tethering line 16 not only simply changes the diameter of the plane's orbit of flight about the pylon 10, but the plane can be made to "dive" and "climb" as it travels about the pylon. Such flight patterns are effected particularly when the tethering line is payed out or reeled in at a relatively rapid rate. In addition, varying patterns of flight, altitude-wise, further can be effected by changing the speed of the plane by operating the rheostat R by means of the speed control button 88. Normally, toy model airplanes of the type usually employed with pylon-type control devices as disclosed herein will not fly above the top of the pylon as it orbits thereabout. However, by making the plane climb and dive during flight, the momentum of the plane during its climb will propel the plane higher than the top of the pylon.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations should be understood therefrom as some modifications will be obvious to those skilled in the art.

I claim:

1. An amusement device, comprising, in combination:

an upright support pylon having a vertical hollow portion extending substantially from top to bottom thereof;

a tethering line disposed in the hollow portion of said pylon with an end portion extending from the bottom of the pylon for grasping and manipulation by an operator of the device and an end portion extending from the top of the pylon for connection to a craft such as a toy airplane, the tethering line being freely movable through the pylon so that the flight of the craft may be manipulated by pulling in or paying out the tethering line;

a craft secured to said tethering line for tethered "-flying" about the pylon;
motor means on said craft;
power means on said pylon;
cable means operatively connecting the motor means and power means;
and switch means for said power means, said switch means being operatively associated with said tethering line and actuated as a function of the amount of tension in the tethering line.

2. The amusement device of claim 1 wherein said switch means is caused to be closed when there is tension in the tethering line and opened when the tension is released.

3. The amusement device of claim 2 wherein the relative lengths of said tethering line and said cable means are such that the outer limit of flight of said craft is determined by the length of said cable means whereby the switch means may be opened when the craft is at its outer limit of flight simply by releasing the tension in said tethering line.

4. An amusement device, comprising, in combination:
a support pylon;
a tethering line associated with said pylon and adapted to be payed out and pulled in relative to the pylon;
a craft secured to said line for tethered "flying" about said pylon;
power means on the pylon and operatively connected through cable means to said craft; and
switch means to activate and deactivate said power means, said switch means being operatively associated with said tethering line and actuated as a function of the amount of tension in the tethering line.

5. The amusement device of claim 4 wherein said switch means is caused to be closed when there is tension in the tethering line and opened when the tension is released.

6. The amusement device of claim 5 wherein the relative lengths of said tethering line and said cable means are such that the outer limit of flight of said craft is determined by the length of said cable means whereby the switch means may be opened when the craft is at its outer limit of flight simply by releasing the tension in said tethering line.

7. In an amusement device which includes a craft attached by means including a power cable to a control means including power means for tethered "flying" of the craft about the control means, and motor means on said craft and operably connected to the control means through said cable, the improvement comprising: a power plug including contact means on the outer end of said power cable, and a socket on said craft for removably receiving the power plug.

8. The amusement device of claim 7 including contact means on said craft associated with said motor means for engaging the contact means on said power plug when the plug is positioned in said socket.

9. An amusement device comprising, in combination:
a craft attached by means including a power cable and a tethering line to a control means, including power means, for tethered "flying" of the craft about the control means,
motor means on said craft and operably connected to the control means,
said control means including an assembly for paying out and reeling in the tethering line, including a rotatably mounted reel and a control lever operably associated with the reel for rotating the reel by manual manipulation of the lever to pay out and reel in the tethering line, and
said control means further including means to vary the speed of said motor means, including a manipulatable speed control handle mounted on the end of said control lever whereby both the speed of the motor means and the paying out and reeling in of the tethering line may be accomplished by grasping the handle and manipulating the handle and said lever.

10. The amusement device of claim 9 wherein said speed control handle is removably mounted on the end of said control lever.

11. An amusement device, comprising, in combination:
a craft attached by means including a tethering line to a control means for tethered "flying" of the craft about the control means,
said control means including an assembly for paying out and reeling in the tethering line, including a rotatably mounted reel on which the tethering line is wound, a control lever, and means operatively connecting the control lever to said rotatable reel so that movement of the lever in one direction permits the reel to rotate to pay out tethering line for said craft and movement of the lever in an opposite direction rotates the reel to wind the tethering line onto the reel, and
said last named means includes lost motion means in the connection between the lever and the reel whereby movement of the lever in said one direction does not positively drive the reel but permits the craft to pull the tethering line from the reel due to the centrifugal force of the craft and thereby prevent entanglement of the line on the reel.

12. The amusement device of claim 11 wherein said connecting means between the control lever and the reel comprises a gear train and said last named means comprises angularly positioned lug means on said lever and on a gear in said train thereof.

13. The amusement device of claim 12 wherein said connecting means between the control lever and the reel comprises a rotatably mounted shaft member on which said lever is fixed for rotation therewith, a disc member fixed to said shaft member for rotation therewith and including an axially protruding lug on said disc and spaced from said shaft member, a gear member mounted on said shaft member for rotation relative thereto but fixed axially thereof, said gear member having an axially protruding lug spaced from the shaft member and extending into the path of rotation of the lug on said disc member, and a second gear member fixed relative to said reel for rotation therewith about the axis of the reel, said second gear member being meshed with the gear member mounted on said shaft member.

14. In an amusement device which includes a craft attached by means including a tethering line to a con-

trol means for tethered "flying" of the craft about the control means, said control means including an assembly for paying out and reeling in the tethering line, including a rotatably mounted reel on which the tethering line is wound, the improvement wherein said reel comprises an inner core on which the tethering line is anchored, an outer core superimposed over the inner core and of a larger diameter than the inner core so as to define space between the cores in which excess portions of the tethering line may be wound on the inner core, and means defining an aperture in the outer core through which the tethering line may extend from said inner core to the exterior of the reel.

15. The amusement device of claim **14** wherein said inner core and said outer core are fixed at adjacent ends thereof to one end disc portion of said reel for conjoint rotation, and including means removably mounting an opposite end disc portion of the reel to the opposite ends of said cores to provide access to said space between the cores to permit the tethering line to be anchored and wound onto the inner core.

16. The amusement device of claim **15** wherein said outer core comprises a cup-like shell fixed to said one end disc portion of the reel, and including a cup-like portion fixed to the opposite end disc portion of the reel and telescoped within the cup-like shell fixed to said one end disc portion of the reel.

17. The amusement device of claim **16** wherein said cup-like shell on said one end disc portion and said cup-like portion on said opposite end disc are press fit together.

18. The amusement device of claim **16** wherein said aperture comprises a slot in the cup-like shell fixed to said one end disc portion opening at the end of the shell opposite the end fixed to the one disc portion.

19. The amusement device of claim **18** wherein said slot extends axially of said cup-like shell and has a length greater than the axial width of the cup-like portion on said opposite end disc.

20. The amusement device of claim **15** including a rod fixed to the inner face of said opposite end disc and extending axially into the space between said cores whereby relative rotation of the end discs will cause said rod to engage the tethering line anchored to the inner core and extending through the aperture in the outer core and thereby wind the tethering line onto the inner core due to said relative rotation of the end discs.

21. In an amusement device which includes a craft attached by means including a power cable to a control means including power means for tethered "flying" of the craft about the control means, and motor means on said craft and operatively connected to the control means through said cable, the improvement comprising: means readily removably mounting said motor means in operating position on said craft to permit easy replacement of the motor means without dismantling the craft, and independent contact means on said craft and so positioned as to operatively connect the motor means to said power cable when the motor means is properly placed in said operating position on the craft.

22. The amusement device of claim **21** wherein said craft comprises a toy airplane with a recess located in the nose thereof for receiving said motor means, and said motor means has a propellor mounted on the front thereof and exposed for rotation when the motor means is disposed in said recess in said operating position.

23. The amusement device of claim **21** wherein said craft has means defining a recess on the exterior thereof for receiving said motor means, and latch means to releasably hold the motor means in the recess in said operating position in connection with said contact means.

24. The amusement device of claim **21** including a power plug on the outer end of said power cable, the power plug having contact means for engaging the contact means on said craft, and a socket on said craft for removably receiving the power plug in position for engagement with the contact means on said craft when the power plug is seated in said socket.

25. An amusement device comprising, in combination:

a craft attached by means including a power cable and a tethering line to a control means, including power means for tethered "flying" of the craft about the control means,

motor means on said craft and operatively connected to the control means,

said control means including an assembly for paying out and pulling in the tethering line, including a control lever mounted for manual manipulation to pay out and pull in the tethering line,

and said control means further including means to vary the speed of said motor means, including a manipulatable speed control means mounted on said control lever whereby both the speed of the motor means and the paying out and pulling in of the tethering line may be accomplished by grasping the control lever and manipulating the lever and said speed control means.

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