Feb. 20, 1962 F. PETTIT 3,022,069

AIRPLANE TOY AND CONTROL THEREFOR

Filed March 22, 1957 4 Sheets-Sheet 1

Fig. 1.

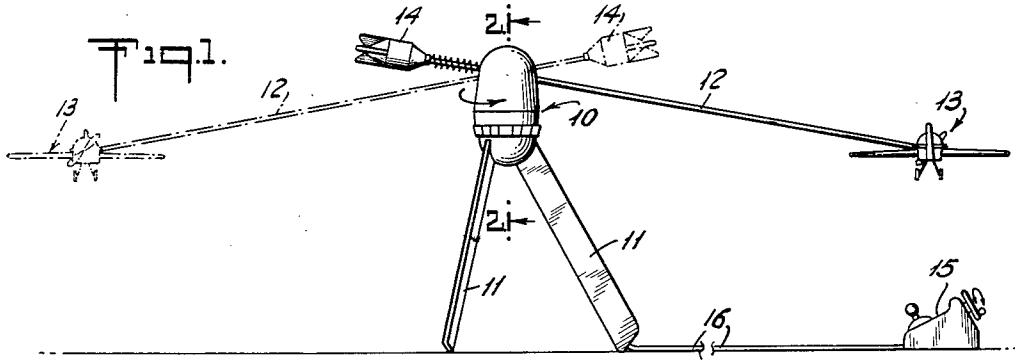


Fig. 2.

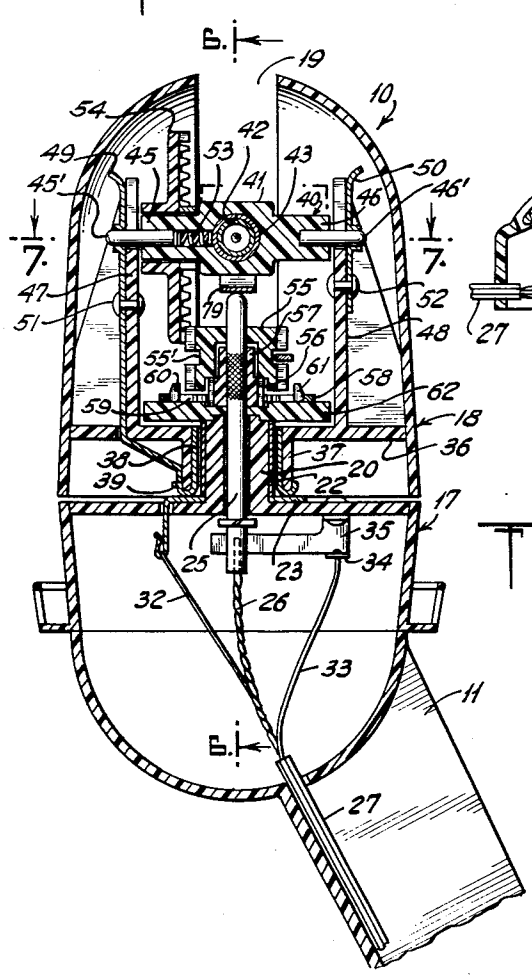


Fig. 3.

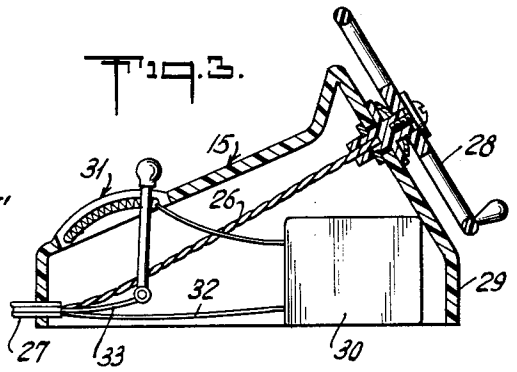


Fig. 4.

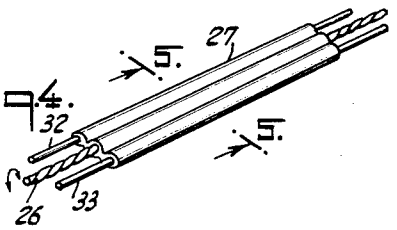
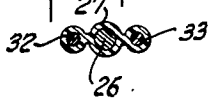


Fig. 5.

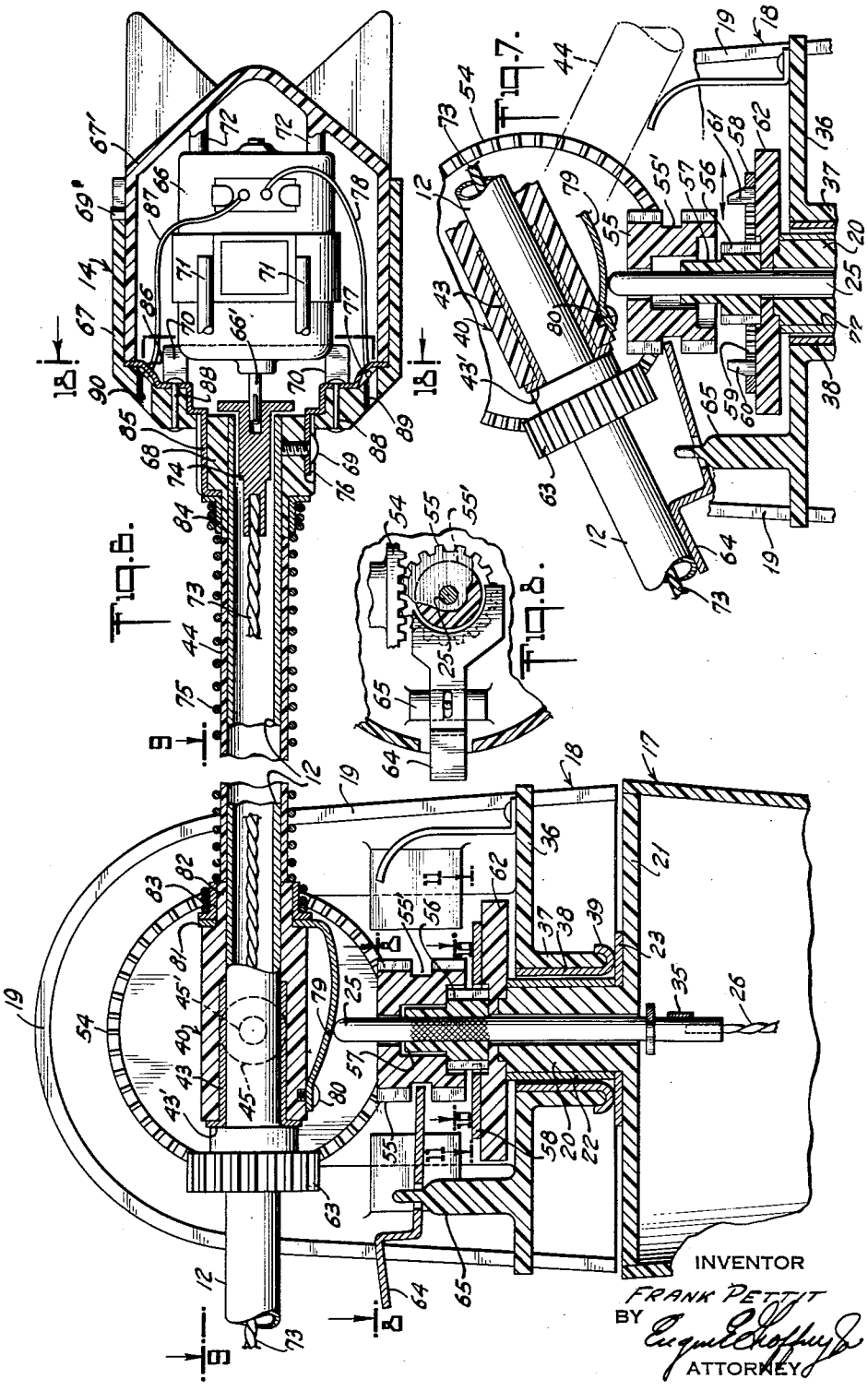


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Feb. 20, 1962 F. PETTIT 3,022,069

AIRPLANE TOY AND CONTROL THEREFOR

Filed March 22, 1957 4 Sheets-Sheet 2



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Feb. 20, 1962 F. PETTIT 3,022,069

AIRPLANE TOY AND CONTROL THEREFOR

Filed March 22, 1957 4 Sheets-Sheet 3

Fig. 9.

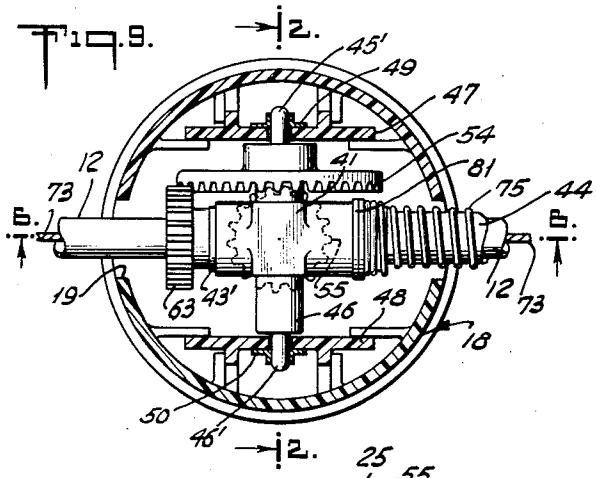


Fig. 10.

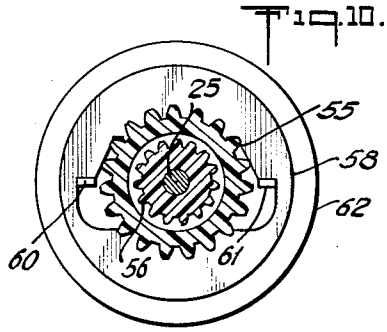


Fig. 11.

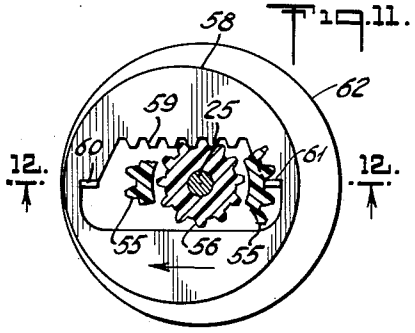


Fig. 12.

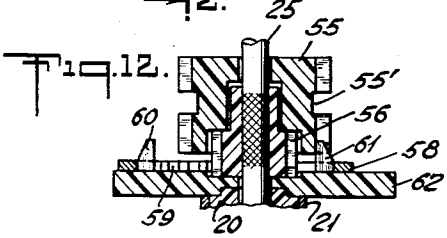


Fig. 14.

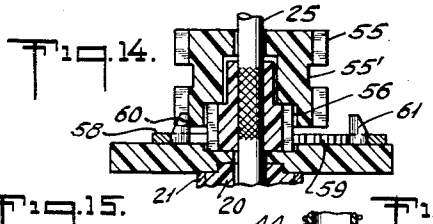


Fig. 13.

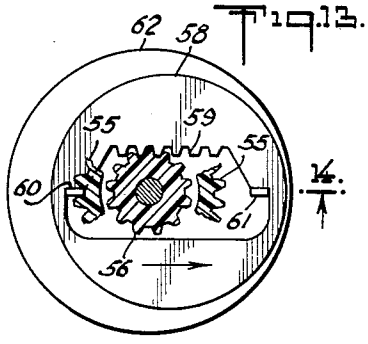


Fig. 15.

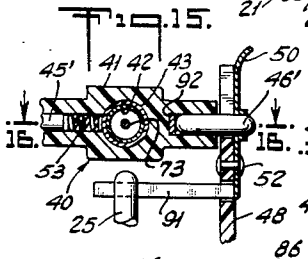


Fig. 16.

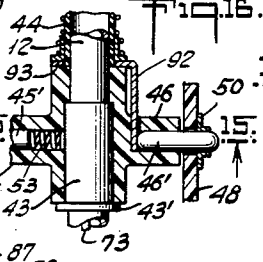


Fig. 18.

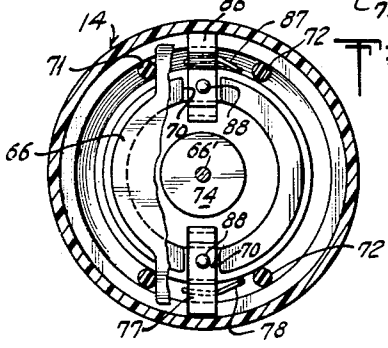
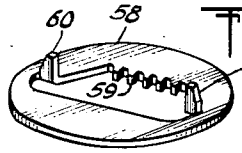


Fig. 17.



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Feb. 20, 1962 F. PETTIT 3,022,069

AIRPLANE TOY AND CONTROL THEREFOR

Filed March 22, 1957 4 Sheets-Sheet 4

Fig. 19.

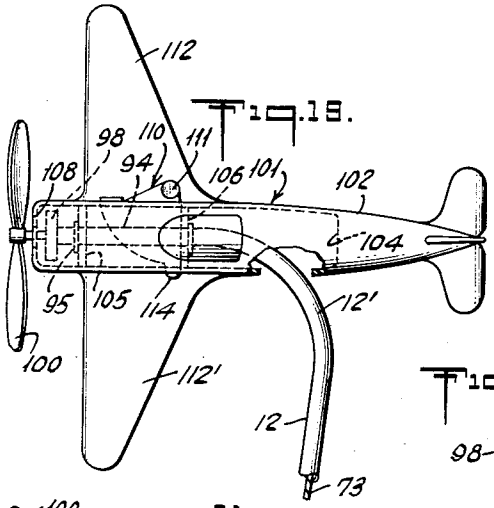


Fig. 21.

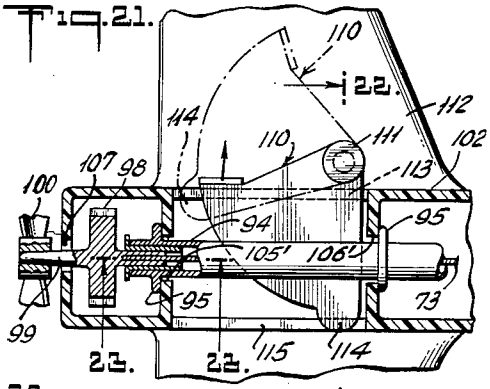
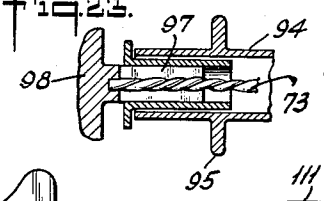
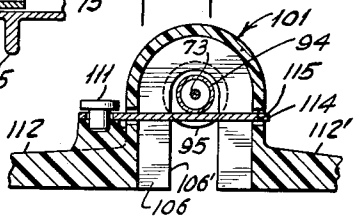


Fig. 23.



22.

Fig. 22.



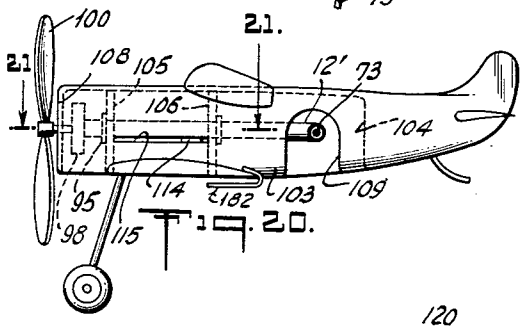
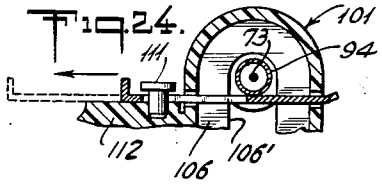


Fig. 20.

Fig. 24.



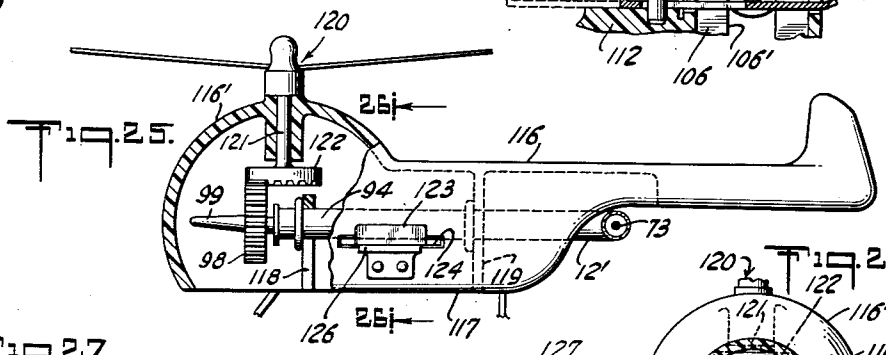


Fig. 25.

Fig. 26.

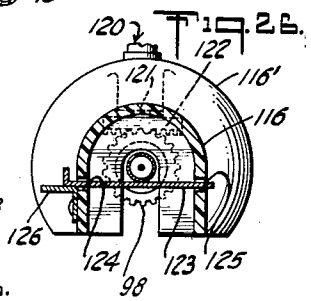
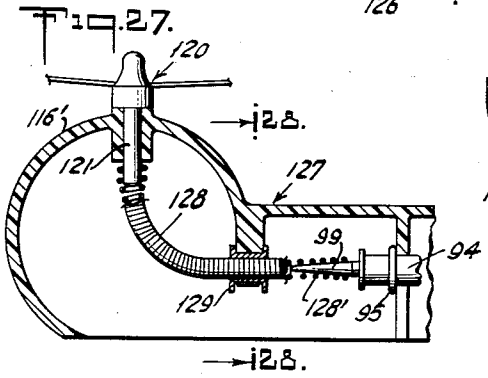


Fig. 27.



28.

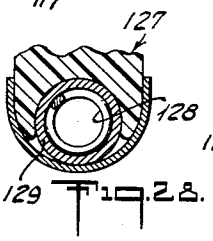


Fig. 28.

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United States Patent Office 3,022,069 Patented Feb. 20, 1962

3,022,069

AIRPLANE TOY AND CONTROL THEREFOR

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Filed Mar. 22, 1957, Ser. No. 647,834
7 Claims. (Cl. 272—31)

This invention relates to toys and more specifically to a novel and improved tethered toy airplane rotatable about a center support to simulate actual flight. The invention further concerns an improved mechanism useful, among other things, for controlling the airplane in flight and improved means for simulating aerial bombing.

Toy aircraft wherein the aircraft is carried by a generally transverse rod rotatably carried by a central support have been proposed, but these devices are relatively complicated, expensive to manufacture and do not afford the desired control characteristics.

Accordingly, one object of the invention resides in a novel airplane toy characterized by its simplicity, positive and dependable control and ease of attachment of the aircraft to the captive arm for operation of the toy.

Another object of the invention resides in the provision of a novel and improved captive toy airplane having positive control for rotation of the captive plane to produce changes in pitch.

A further object of the invention resides in a novel and improved toy airplane structure including a dependable and simplified means for coupling fixed and movable wing aircraft to the carrying arm for rotation about a center support.

A further object of the invention comprises a novel and improved rotatable wing aircraft including means for removably attaching it to the carrying arm.

A still further object of the invention resides in a novel and improved fixed wing aircraft including means for removably attaching it to a carrying arm for rotation about the center support.

A still further object of the invention resides in the provision of an improved arrangement and combination of elements for remotely controlling the rotation of the member about its own axis.

A still further object of the invention resides in a novel and improved control mechanism for captive toy aircraft.

A further object of the invention resides in a novel and improved arrangement and combination for elements for powering propeller of captive fixed and movable wing aircraft.

The above and other objects of the invention will become more apparent from the following description and accompanying drawings forming part of this application.

In the drawings:

FIG. 1 is a perspective view of a toy in accordance with one embodiment of the invention;

FIG. 2 is a cross sectional view of FIG. 1 taken along the line **2—2** thereof showing certain details of the control mechanism for varying the pitch of the captive aircraft in flight;

FIG. 3 is a cross sectional view of the aircraft control mechanism illustrated in FIG. 1;

FIG. 4 is a perspective view of the control cable for coupling the manually operated control mechanism with the aircraft controlling means in the central support to change the pitch of the aircraft and the speed or rotation of the propeller or rotatable wing as the case may be;

FIG. 5 is a cross sectional view of FIG. 4 taken along the line **5—5** thereof;

FIG. 6 is an enlarged cross sectional view of FIG. 2 taken along the line **6—6** thereof.

FIG. 7 is a cross sectional view of FIG. 2 taken along the line **6—6** thereof with the outwardly extending arm in the lowermost position.

FIGS. 8 through 11 are cross sectional views of FIG. 6 taken along the lines **8—8** through **11—11** thereof;

FIG. 12 is a cross sectional view of FIG. 11 taken along the line **12—12** thereof;

FIG. 13 is a cross sectional view similar to FIG. 11 with certain elements shifted to illustrate the operation thereof;

FIG. 14 is a cross sectional view of FIG. 13 taken along the line **14—14** thereof;

FIG. 15 is a fragmentary section of FIG. 2 showing a modified embodiment of the invention for energizing the propeller drive motor and constitutes a cross sectional view of FIG. 6 taken along the lines **15—15** thereof;

FIG. 16 is a cross sectional view of FIG. 15 taken along the line **16—16** thereof;

FIG. 17 is a perspective view of one element of the control mechanism shown in FIGS. 11 and 13;

FIG. 18 is a cross sectional view of the propeller drive motor assembly shown in FIG. 6 and taken along the line **18—18** thereof;

FIG. 19 is a plan view of a fixed aircraft in accordance with one embodiment of the invention;

FIG. 20 is a side view of the aircraft shown in FIG. 19;

FIG. 21 is a fragmentary cross sectional view of FIG. 20 taken along the line **21—21** of FIG. 20;

FIGS. 22 and 23 are cross sectional views of FIG. 21 taken along the lines **22—22** and **23—23** thereof;

FIG. 24 is a view similar to FIG. 22 illustrating the operation of the latch for removably attaching the aircraft to the supporting arm;

FIG. 25 is a side elevation in partial cross section of a movable wing aircraft in accordance with the invention;

FIG. 26 is a cross sectional view of FIG. 25 taken along the line **26—26** thereof;

FIG. 27 is a fragmentary view of a movable wing aircraft similar to FIG. 25 showing a modified drive;

FIG. 28 is a cross sectional view of FIG. 27 taken along the line **28—28** thereof.

The invention for purposes of illustration has been shown as a toy wherein a fixed or movable wing aircraft is carried on the outer end of a rod pivoted for rotation about a central pylon. The airplane propeller is driven by a motor carried by the other end of the supporting rod or arm and is disposed on the opposite side of the pivot or pylon from the aircraft to act as a counter balancing mechanism. Means are provided in the form of a manually operated control box for controlling the speed of the propeller drive motor and also to vary the pitch of the aircraft by rotating the rod about its own axis. A toy of this general character is shown and described in applicant's prior Patent No. 2,699,334, granted January 11, 1955 and entitled "Airplane Toy." While this invention relates to improved devices and cooperating elements for airplane toys it will become apparent, however, from the specification and drawings that certain features of the invention are generally useful in other types of toys and equipment.

The invention is shown generally in FIG. 1 and comprises a central pylon or tower **10** having a plurality of supporting legs **11**, a transverse arm **12** carried by the pylon for rotation in a horizontal plane and about its own axis, a fixed or movable wing aircraft carried on one end of the arm **12**, a drive motor **14** carried on the other end of the arm **12** and functioning as a counter balancing mechanism and lastly, a control box **15** coupled to the pylon **10** by a control cable **16** for controlling both the speed of the drive motor **14** as well as the rotation of the arm **12** about its own axis.

With the foregoing arrangement of elements and with the airplane **13** arranged to slightly overcome the weight of the motor **14**, the airplane will normally rest on the

supporting surface when the airplane propeller is at rest. To operate the apparatus the propeller motor is energized to rotate the airplane propeller and produce rotation of the aircraft about the pylon 10. The wings in the case of a fixed aircraft are set at an angle that will impart lift to the aircraft and cause it to rise from the surface and landing aid takeoff is effected by control of the speed of the aircraft propeller. When the aircraft is airborne rotation of the arm 12 by the control mechanism will shift the pitch of the aircraft 13 and cause it to descend or ascend as the case may be. In this way the operator can control the aircraft to land and take off and in addition produce a number of varied aircraft motions such as loops and the like.

More specifically the toy in accordance with the invention utilizes improved control means providing positive pitch control of the aircraft in flight and facilitating operation and further includes automatically operable means for disconnecting the pitch control from the supporting arm 12 to prevent damage to the control mechanism. The invention also includes an improved arrangement for coupling either a fixed wing aircraft or a helicopter to the arm and for driving the propeller or rotary ring as the case may be.

Another aspect of the invention resides in an improved control for modifying the pitch of the aircraft to avoid the need for mechanical coupling between the control box 15 and the pylon 10.

As pointed out above the aircraft supporting arm or rod 12 is mounted on the pylon for movement in both vertical and horizontal planes and in addition means are provided for rotation of the rod 12 about its own axis in response to operation of the control 15. These structures are shown in FIGS. 2 through 13 and 17 and will now be described.

The top portion of the pylon 10 is formed in two individual sections 17 and 18, the bottom section 17 being generally hemispherical while the top section is elongated and has a slot 19 therein to receive the arm 12 and permit reciprocation in the vertical plane. The bottom section 17 of the pylon is fixedly supported by the legs 11 and also includes a central collar 20 supported by a transverse member 21 attached to the walls of the body 17. Surrounding the collar 20 there is an annular bushing 22 having a flanged bottom portion 23 resting on the transverse member 21. The bushing and flange are of conductive material and a lug 24 electrically coupled to the flange 23 extends downwardly through the transverse member 21. The plyon members 17 and 18 as well as the collar 20 and transverse member 21 are preferably made of an insulating material.

A central control shaft generally denoted by the numeral 25 extends upwardly through and is rotatably supported in the collar 20 and forms part of the aircraft pitch controlling mechanism. Rotation of the shaft 25 is accomplished by a flexible cable 26 extending through a sheath 27 to the control box 15. The outer end of the control cable 26 is coupled to a hand wheel 28 mounted on the control box housing 29 so that rotation of the hand wheel imparts equivalent rotation to the shaft 25 within the pylon 10. In addition to the hand wheel control 28 the control box may include a self-contained A.C. or D.C. power supply 30 for operating the propeller drive motor 14 and a control rheostat 31. Power from the supply 30 is fed through the rheostat 31 to a pair of wires 32 and 33 also housed within the sheath 27 as shown in FIG. 5 and the pylon end of these leads are connected to the lug 24 and a second lug 34 forming part of a spring contact assembly 35, the latter being secured to the underside of the transverse member 21 and bearing firmly against the control shaft 25 which is of a suitable conductive material.

The upper portion 18 of the pylon 10 is rotatably mounted on the lower pylon section 17. For this purpose the portion 18 includes a transverse member 36 spaced inwardly from the lower edge of housing 18 and provided with a central opening having a downwardly extending peripheral flange 37. A bushing 38 disposed within and carried by the flange 37 rotatably receives the bushing 22 attached to the lower pylon section 17. The lower end of the bushing 38 is curved outwardly as shown enclosing the lower end of the flange 37 and acting as a thrust bearing against the flange 23.

With the arrangement thus far described both electrical energy as well as rotary motion for controlling pitch have now been transmitted from the control mechanism to the rotary member 18 of the pylon 10. The airplane arm 12 preferably constitutes a piece of electrically conductive tubing supported within the pylon by a trunnion block 40 preferably formed of insulating material. This block comprises an elongated central section 41 having a central opening 42 therein tightly receiving a flanged bushing 43 fixedly mounted on the arm 12. The flange 43' of the bushing 43 slidably abuts the hub of gear 53 to limit motion of the arm 12 to the right as shown in FIG. 6 and an insulating sleeve 44 surrounding the arm 12 between the pylon 10 and the motor assembly 14 limits movement of the arm 12 to the left so that in the final structure the arm 12 may rotate within the member 41 but cannot move lengthwise thereof. The trunnion block 41 further includes a pair of outwardly extending bosses 45 and 46 each of which includes a trunnion 45' and 46', respectively securely mounted therein.

The trunnions 45' and 46' rotatably engage a pair of upwardly expending members 47 and 48 of insulating material and carried by the transverse housing member 36. The actual bearing surfaces for the pins 45' and 46' actually comprise metallic members 49 and 50 having flanged openings to receive the outer ends of the trunnion pins and are securely attached to the outer walls of the members 47 and 48 by rivets 51 and 52 or other suitable fastening means. The pins 45' and 46' are received in slots 47' and 48' of the members 47 and 48 so that by springing the members 49 and 50 outwardly the arm 12 and the assembly 41 can be readily removed from the pylon. The metallic strip 49 in addition to providing a bearing surface for the trunnion pin 45' also provides an electrical connection to the metallic arm 12. For this purpose the member 49 extends downwardly through the transverse member 36 and has its lower end electrically connected to the outwardly formed flange 39 on the bearing member 38. Energy now applied to the pin 45' is transmitted to the arm 12 by means of a spring 53 disposed within an opening between the pin 45' and the central opening 42 in the member 41 which rotatably receives the bushing 43 and the arm 12.

Rotation of the arm 12 about its own axis is accomplished by a gear train which includes a ring gear 54 rotatably carried by the member 45 of the trunnion block 40 and a cooperating spur gear 55 rotatably mounted on the shaft 25 previously described. More specifically the shaft 25 includes a driver gear 56 fixedly secured to the shaft and having an upwardly extending collar 57. Surrounding the spur gear 56 is a generally circular translatable member 58 having an elongated opening with a series of lineally disposed teeth 59 along one side thereof which engage the spur gear 56. In addition the translatable member 58 further includes a pair of upwardly extending tabs 60 and 61 for engaging the lower portion of the spur gear 55 as will be described. The translatable member 58 lies flat against a plate 62 which is cemented or otherwise fixedly carried on the upper end of the collar 20 and in spaced relationship to the transverse member 36 so that the plate 62 will not rotate with the upper pylon member 18.

The translatable plate is shown more clearly in FIGS. 11 to 14 and 17 and it will be observed that as the gear 56 is rotated by operation of the hand wheel 28 the plate 58 will shift in one direction or the other depending on the direction of rotation of the gear.

The gear 55 preferably includes a central annular recess or slot 55' which in effect forms the gear 55 into a pair of identical upper and lower sections. The gear is rotatably mounted on the collar 57 forming part of the gear 56 and the lower end of the gear 55 extends below the upper edges of the tabs 60 and 61. With this arrangement when the gear 56 is rotated in a counter clockwise direction as shown in FIG. 11, the tab 61 will be brought into engagement with the lower portion of the gear 55 and effect positive rotation thereof. Similarly, if the gear 56 is rotated in a clockwise direction the plate 58 will move to the right as shown in FIG. 13 and engage the tab 60 with the gear 55 to impart reverse rotation thereto. Since the gear 55 is meshed with the ring gear 54 corresponding rotation will be imparted to the ring gear. Rotation of the ring gear is in turn imparted to the rod 12 by means of a spur gear 63, shown in FIG. 6, which is fixedly mounted on the rod 12.

While rotation of the shaft or arm 12 is positively effected by rotation of the hand wheel 28 to vary the pitch of the aircraft, displacement of the aircraft in a vertical plane is a function solely of the pitch of the aircraft and the thrust which is controlled by the speed of the drive motor 14.

To avoid damage to the control of the aircraft when the latter is in the landed position, means are provided to disconnect the pitch control from the arm 12 when the aircraft nears its landing position. This prevents changing of the pitch of the aircraft in the lowered position and enables a more realistic approach to be made. This feature is desirable both in the connection with fixed wing aircraft as well as rotary wing aircraft, such as helicopters. These ends are attained through the use of a lever 64 pivotally mounted on a boss 65. The inner end of the lever rotatably engages the recess 55' while the outer end of the lever may protrude slightly from the housing 18 in line with the aircraft side of the arm 12. The operation of this lever is shown more clearly in FIG. 7 wherein the outer end of the arm 12 is tilted downwardly with the aircraft 13 resting on the ground. It will be observed that the inner end of the arm 64 has been tilted upwardly lifting the gear 55 out of operable engagement with the tabs 60 and 61 of the translatable member 58. With the aircraft at rest on the runway, it is of course necessary first to apply thrust to the aircraft by operation of the motor 14 through the rheostat 31. After the aircraft has gained elevation, the gear 55 is automatically lowered so that it can be engaged by the tabs 60 and 61 as previously described to control the flight.

The driving motor assembly 14 operates both to drive the propeller or rotary aircraft ring as the case may be and in addition functions as a counterweighting mechanism. The propeller drive motor 66 is disposed within the housing formed of a fixed cylindrical member 67 and a removable cylindrical cap 67' held in position by a bayonet pin 69' and cooperating slot. The motor housing 67 is fixedly carried on the shorter end of the arm 12 as shown in the figures and includes a collar or cylindrical extension preferably formed as an integral part of the housing 67 for receiving the end of the arm 12. The housing 67 is fixed to the shaft 12 by means of a screw 69 that threadably engages the collar 68 and bears firmly against the shaft. The motor is positioned within the housing 67 and is centered by three or more projections 70 extending from the base of the housing 67 and locked against rotation by a pair of rod-like members 71 forming part of the housing 67. The motor is held in position by the rear housing portion 67' which carries tabs 72 holding the motor firmly against the tabs 70. Rotary motion is transmitted from the motor to the aircraft and of the arm 12 by means of a flexible cable 73 disposed within the arm 12 and secured to the motor shaft 66' by means of a suitable coupling member 74 as may be observed more clearly in FIG. 6.

Electrical energy for the motor 66 is fed to the motor by means of the shaft 12 and a spring-like conductor 75 wound about the insulating sleeve 44. More specifically, the motor housing 67 includes a strap 76 that is engaged by the set screw 69 and extends through a suitable opening into the housing 67 whereupon it is bent outwardly to abut the housing wall. The end of the strap 76 includes a curved portion 77 for receiving one motor lead 78. When the housing section 67' is assembled to the housing section 67 the inner end of the housing 67' abuts against the curved portion 77 of the strap 76 to pinch the end of the wire 78 between the strap 76 and the housing wall. Since the strap 76 engages the screw 69 electric current will flow from the tube 12 through the screw 69 and into the strap 76.

The second connection to the electric motor is completed by means of a leaf spring 79 secured to the underside of the trunnion member 40 previously described by means of a screw 80. The spring 79 is curved and bears against the central shaft 25. On the right hand end of the spring 79 as shown in FIG. 6 there is a washer-like member 81 integrally formed therewith which engages a reduced section 82 of the trunnion member 40. The member 81 is held in place by a flanged collar 83 of conductive material. Electric energy from the collar 83 is then transmitted to the motor via the spiral spring-like conductor 75 which engages a flanged collar 84 abutting the collar 68 of the motor housing 67. A second metallic strap 85 extends through the collar 68 and contacts the flange collar 84. The inner end of the strap 85 is provided with a curved section 86 to receive the end of the second motor wire 87 and the curved section 86 is moved downwardly into firm contact with the end of wire 87 upon insertion of the housing part 67'. The two conductive straps 76 and 85 are permanently fixed to housing 67 by rivets 88 or other suitable fastening means. To facilitate the insertion of the ends of the wires 78 and 87 beneath the contact parts 77 and 86, openings 89 and 90 are provided in the housing 67 for insertion of a suitable tool to lift the curve section 77 and 86 for insertion of the wires.

With the structure as described above the operator of the toy can readily vary the speed of the captive aircraft by operation of the rheostat 31 and can effect positive control of the pitch of the aircraft merely by operation of the hand wheel 28.

FIGURES 15 and 16 illustrate a modification of the electrical means for transmitting power from the conductors 32 and 33 in the flexible cable to the motor 66. In this embodiment of the invention the contact spring 79 which bears against the top end of the shaft 25 as shown in FIGURE 6 is eliminated and in place thereof the trunnion bearing 50 is provided with an inwardly extending spring 91 which bears against the upper end of the shaft 25. The trunnion housing 41 includes a metal strap 92 which contacts the inner end of the trunnion pin 46' and terminates in a contact ring 93 corresponding to the contact ring 81 as shown in FIGURE 6. The ring 93 however is held in spaced relationship to the tube or arm 12 by the insulating sleeve 44. Electrical contact with the ring 93 is provided in the same manner as described in connection with the previous embodiment of the invention.

In addition to the improved control system as described above the invention further contemplates a novel and improved fixed wing and helicopter construction which facilitates attachment of the aircraft to the outer end of the rod 12. Referring first to the fixed wing adaptation shown in FIGS. 19 through 24, it will be observed that the outer end of the rod or arm 12 includes a curved section 12' which terminates in a straight section 94 extending in the direction of rotation of the arm 12. The terminal section 94 of the arm is provided with a pair of spaced collars 95 and 96. Fixedly secured to the outer end of the flexible cable 73 is a cylindrical member 97 rotatably mounted in the end of the tube section 94 and

carrying a spur gear **98**. The spur gear further includes an outwardly extending tapered pin **99** for frictional engagement with a suitable propeller **100** forming part of the fixed wing aircraft generally denoted by the numeral **101**.

The aircraft **101** is provided with a fuselage **102** that is of hollow construction and has an opening **103** in the bottom thereof as defined by the dotted outline **104** in FIGURE 20. Within the fuselage there are a pair of transverse members **105** and **106** each having an elongated slot **105'** and **106'**, respectively, for receipt of the arm section **94**. The members **105** and **106** are spaced apart a distance slightly less than the distance between the collars **95** and **96** so that the collars will engage the outer surfaces of these members. A similar slot **107** is provided in the underside of the front wall **108** of the fuselage **102** for reception of the tapered pin **99** for carrying the propeller **100**. The side wall of the fuselage is also opened at **109** to accommodate the curved section **12'** of the arm **12**.

The aircraft **101** is secured in place on the end of the arm **12** by a latch generally denoted by the numeral **110**. The latch is in the form of a sector having an angular width of slightly less than 90 degrees and is pivoted at **111** to the right wing **112**. The right side of the fuselage includes an elongated slot **113** that is slightly below the arm section **94** when the latter is in place in the slots **105'** and **106'**. When the straight section **94** of the arm **12** is in place in the aircraft the latch **110** is moved inwardly to the solid line position as shown in FIG. 21 and an outwardly extending tab portion **114** forming part of the latch **110** engages a slot **115** in the opposing fuselage wall shown in FIG. 22. When the aircraft **101** is locked onto the arm **12** the propeller **100** is then frictionally engaged with the end of the pin **99**.

From the above it will be observed that while the aircraft is firmly secured to the arm **12** it is free to rotate about its longitudinal axis and will tend to maintain proper flight position at all times. In order to effect realistic take offs and landings the wings **112** and **112'** are provided with a slight slope in order to effect the desired amount of lift at the speeds at which the toy will be normally operated. To remove the aircraft **101** from the arm it is merely necessary to withdraw the latch **110** to the dotted line position shown in FIG. 21. The propeller **100** may be removed either before or after removal of the aircraft.

A rotary wing aircraft or helicopter may also be attached to the end of the arm **12** and one embodiment of such an aircraft is shown in FIGS. 25 and 26. The helicopter fuselage **116** generally simulates an actual helicopter and is provided with an open bottom portion **117** for reception of the arm sections **94** and **12'**. As in the case of the fixed wing aircraft the helicopter also includes a pair of transverse members **118** and **119** that include suitable slots for the reception of the arm section **94**. The rotary wing or blade assembly **120** of the helicopter is rotatably mounted on the top of the forward rounded section **116'** of the helicopter fuselage and is driven by a shaft **121** carrying a ring gear **122** on the lower end thereof. This ring gear is positioned along with the transverse members **118** and **119** so that the spur gear **98** driven by the flexible cable **73** will operate the wing assembly **120** in a counterclockwise direction as viewed from the top. The helicopter is held in position on the arm **12** by a slidable latch **123** that moves into and out of engagement with slots **124** and **125** as shown in FIG. 26. To facilitate operation of the latch **123** an angle member **126** is secured to the side of the helicopter to form a bearing surface. As in the case of the fixed wing aircraft it will be observed that the helicopter is also movable about its own longitudinal axis. In operation of the helicopter, hovering forward travel and rearward travel is controlled by changing the pitch of the craft in the same manner as with fixed wing craft.

A modified form of the helicopter is shown generally in FIGS. 27 and 28. Inasmuch as the gear **98** is required primarily for driving the rotary blades of the helicopter this gear may be eliminated when using the modified helicopter structure now to be described. The modified helicopter generally denoted by the numeral **127** is secured to the arm section **94** in the same manner previously described. The tapered end section **99** driven by the flexible cable **73** engages a flexible spring **128**, one end of which rides in a horizontally disposed bearing **129** and the other end engages the downwardly extending rotary blade shaft **121**. By providing a tapered end portion **128'** on the spring **128** rotation of the tapered pin **99** will set itself firmly in engagement with the tapered spring part **128'** during operation of the apparatus and will drive the rotary blade assembly **120** in the same manner heretofore described.

While only certain embodiments of the invention have been illustrated and described it is apparent that other modifications, alterations and changes may be made without departing from the true scope and spirit thereof as defined by the appended claims.

What is claimed is:

1. In a toy a pylon, an aircraft carrying arm pivotally mounted on said pylon for movement about its own axis, a central vertical axis of the pylon and a horizontal axis, intersecting the vertical axis, a gear coaxially positioned relative to the vertical axis of rotation, a drive gear secured to said arm, gear means coupling said coaxial gear and said drive gear, a shaft axially coincident with said vertical axis and relative to said coaxial gear and clutch means coupling said shaft and coaxial gear, said clutch means including gear fixedly carried by said shaft, a plate having an elongated opening therein with gear teeth formed along one edge of said opening, said plate being movably supported with the gear teeth in engagement with said shaft gear, and coaxial gear engaging tabs carried at opposite ends of said plate whereby partial rotation of said shaft in one direction will move one tab into engagement with said coaxial gear and impart rotation thereto and movement of the shaft in the other direction will first disengage said one tab, then engage the other tab and impart rotation in the other direction to said coaxial gear.

2. In a toy according to claim 1 including a motor for driving said shaft.

3. In a toy according to claim 1 wherein said coaxial gear is movable out of tab engaging position and a pivotally mounted gear engaging bracket is actuated by lowering of said arm to move said gear out of said tab engaging position.

4. A tethered aircraft toy comprising a pylon having a rotatable upper portion, an aircraft carrying arm pivotally secured to said upper portion, said arm having a curved end part for receiving and carrying a helicopter type aircraft, a motor carried at the other end of said arm, a flexible drive cable driven by said motor and extending through said arm, said cable extending from said curved end part and carrying a driving gear and said helicopter aircraft having a fuselage including an elongated arm receiving channel in the under side thereof and a slot in at least one side thereof, arm engaging means on said fuselage for locking the fuselage against relative longitudinal movement, a latch slidably engaging said slot and movable therethrough, said latch upon movement through the fuselage slot and extending beneath the arm to hold the helicopter on said arm, a vertically disposed shaft in said fuselage and extending through the upper side thereof, helicopter blades carried on the upper end of said shaft and a gear on the lower end of said shaft and meshing with the first said gear.

5. A tethered toy aircraft comprising a pylon having a rotatable upper portion, an arm pivotally carried by said upper portion and having a curved end part fot carrying a toy helicopter, the latter including helicopter blades, a motor carried at the other end of said arm, a

driving cable connected with said motor and extending through said arm, said cable extending from said curved end part and carrying a conical member, said aircraft having an elongated arm receiving channel on the under side thereof, arm engaging means on said fuselage for locking the fuselage against relative longitudinal motion on said arm, a latch movable into and out of a position extending through the fuselage and beneath the arm to hold the helicopter on said arm, a vertically disposed shaft extending through the upper side of said fuselage and carrying said helicopter blades and a flexible shaft connected at one end to the lower end of the first said shaft and at the other end to said conical member.

6. A tethered aircraft toy comprising a pylon having a rotatable upper portion, an arm pivotally connected to said upper portion, said arm having a curved end part for carrying a toy aircraft, a motor carried by one end of said arm, a flexible cable driven by said motor and extending through said arm, the other end of said cable including propeller attaching means extending from said curved end part, a toy aircraft including a fuselage having an elongated channel formed in the underside thereof and a side opening, said channel rotatably receiving the curved end portion of said arm with the propeller attaching means extending forwardly relative to said fuselage for attachment of a propeller and latching means carried by said toy aircraft and slidably movable through said fuselage opening and beneath the curved end part of said arm when the latter is seated in the channel for securing the toy aircraft to said arm.

7. A tethered toy aircraft according to claim 6 wherein said propeller attaching means comprises a tapered member extending from said fuselage for attachment of the toy aircraft propeller.

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