Feb. 10, 1953 E. FIELDS 2,628,095

TOY ROUNDABOUT

Filed Sept. 10, 1947

FIG. 1

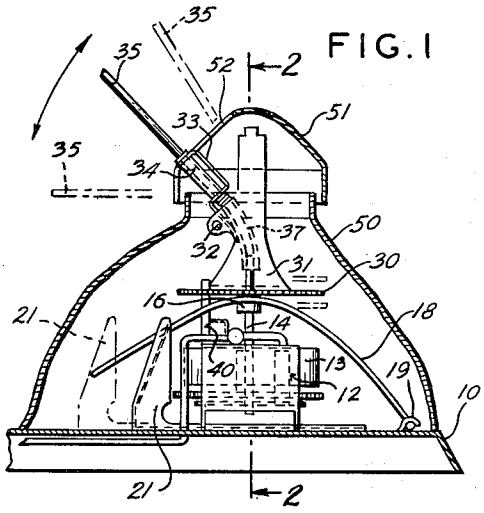
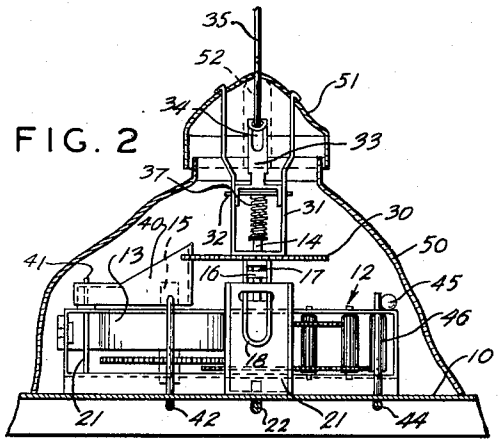
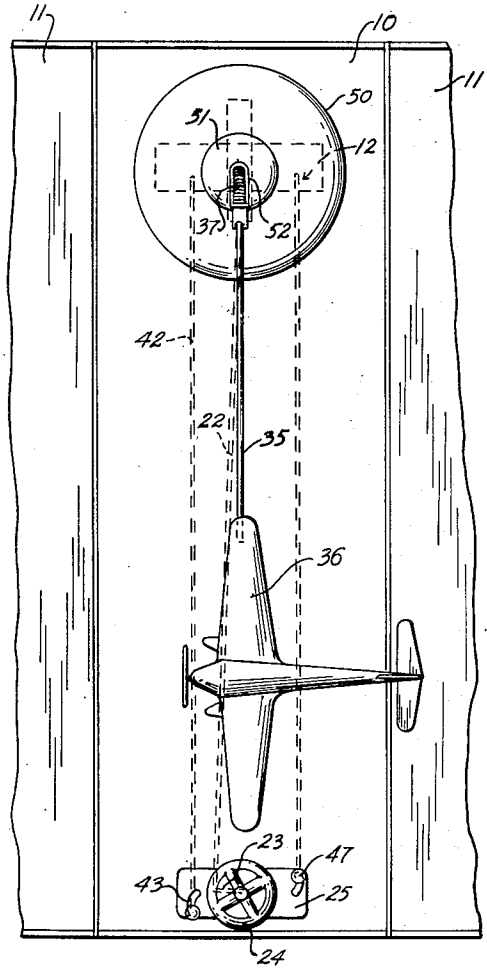


FIG. 2





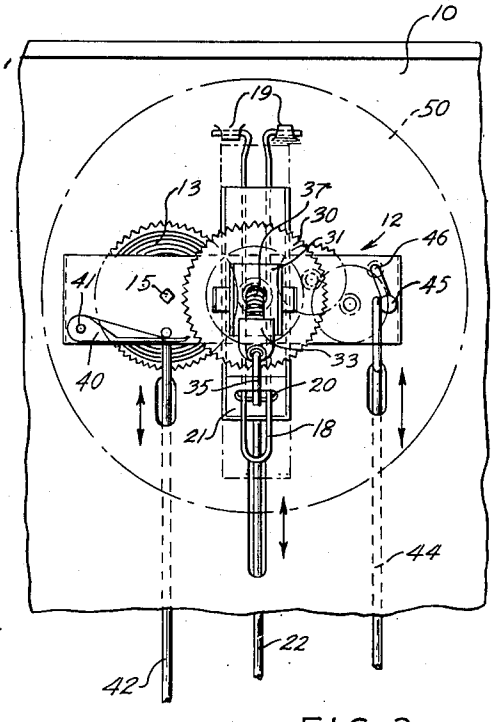


FIG. 3

FIG. 4

INVENTOR
ERNEST FIELDS
BY Frederick E. Haas
ATTORNEY

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TOY ROUNDABOUT

Ernest Fields, New York, N. Y.

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4 Claims. (Cl. 272—31)

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This invention relates to a mechanical toy, particularly to a mechanical toy of the class in which a selected variety of movements can be imparted to a dummy for instance a toy airplane, a bird or other animal by drive means such as a spring-wound motor.

One object of the invention is to provide a mechanical toy of the general class, above referred to, which permits the operator to impart to a toy airplane or other toy a controlled rotary movement.

Another object of the invention is a mechanical toy of the general class, above referred to, which permits the operator to impart to a toy airplane or other toy, a rotary movement and in addition to control the climbing and descending of the airplane as well as the take-off and the landing of the plane.

Another object of the invention is to provide a mechanical toy of the general class, above referred to, which permits the operator to selectively impart to the toy either a controlled rotary flight movement or to cause the airplane to fly in loops.

Another object of the invention is to provide a mechanical toy of the general class, above referred to, which is equipped with a common control board or panel for control of a change from loop flight to rotary flight and vice versa and for control of the rotary flight as to climbing and descending.

Another object of the invention is to provide a mechanical toy of the general class, above referred to, which permits the operator to cause a toy airplane or similar toy first to take off, then to rotate, then to fly through one or more loops, again to rotate and finally to land, thereby offering a playing child a great variety of interesting and educating operations.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and set forth in the appended claims forming part of the application.

In the accompanying drawing a now preferred embodiment of the invention is shown by way of illustration and not by way of limitation.

In the drawing:

Fig. 1 is an elevational section view of the drive and control mechanism of a mechanical toy according to the invention.

Fig. 2 is an elevational sectional view along line 2—2 of Fig. 1.

Fig. 3 is a plan view of Fig. 2.

Fig. 4 is a plan view of the entire mechanical toy according to the invention.

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Referring now to the figures in detail, the mechanical toy shown in these figures comprises a base plate 10 preferably imprinted or painted to simulate a runway of an airport. Extension plates 11 and 11' are hinged to base plate 10 to extend the simulated airport. Base plate 10 supports a drive motor, generally designated by 12, such as a conventional spring-wound motor or an electric motor. Motor 12 comprises a spring 13 which serves to rotate a drive shaft 14 through a reduction gear train. The spring can be wound in a conventional manner by means of a key inserted upon a winding post 15. A guiding collar 16 is axially slidably and rotatably mounted on drive shaft 14. Collar 16 is provided with an annular groove 17 which is slidably engaged by the prongs of a substantially U-shaped fork 18 pivotally connected to base plate 10 at the open ends of the prongs by a bearing 19. The prongs of the fork which form a bracket are curved as can best be seen in Fig. 1. The closed end of the fork is slidably passed through a slot 20 of a frame 21 supported on base plate 10. The frame is slidable on plate 10 substantially in the direction of the apex of fork 18. As will be apparent, a displacement of frame 21 will cause a corresponding lifting or lowering of the apex of the fork causing also a lowering or lifting of collar 16. Fig. 1 shows two different positions on frame 21 in full and dotted lines respectively. For the purpose of displacing frame 21, the same is linked to one end of link 22, the other end of which is pivoted to a second link 23 which in turn can be pivoted by rotation of a hand wheel 24. This hand wheel is rotatably supported on a control board or panel 25 fastened to base plate 10. As will be evident, a rotation of the hand wheel controls the position of frame 21 and hence the axial position of collar 16 relative to drive shaft 14.

Guiding collar 16 supports a driving member shown as a gear 30 which is rigidly connected to the collar and is axially slidable and rotatable on drive shaft 14 so that gear 30 can be arrested while shaft 14 continues rotation and that the shaft will rotate the gear when the same is released. This purpose will be automatically attained by the normal friction between the drive shaft and the gear. The gear in turn supports a substantially U-shaped standard 31 which is fixed to the gear as can best be seen in Fig. 2. Between the two arms of the standard, there is pivotally supported by means of a pivot 32 a sleeve holder 33 which serves as a bearing for a rotatably mounted sleeve 34. In this sleeve, a

rod 35 is removably inserted the free end of the rod supporting a toy airplane 36 or any other toy article such as a bird or an airship. The lower end of sleeve 34 which extends from sleeve holder 33 is engaged by one end of a spiral coil 37 the other end of which engages drive shaft 14. As will be apparent, the coils of the spring engaging drive shaft 14 will be slightly reduced in diameter by reason of the bending of the spring and a rotation of the drive shaft, thereby providing a torque transmitting connection between the drive shaft and the spiral spring.

For the purpose of arresting a rotation of gear 30, there is provided a latch 40 which is pivoted to the upper plate of motor 12 by a pivot 41. Latch 40 is controlled by a bar 42, the other end of which is extended to control panel 25. A handle 43 connected to bar 42 serves to move the bar axially in either direction. As will be apparent, an operation of handle 43 permits to move the nose of latch 40 either into engagement with gear 30 thereby locking the same or to withdraw the latch nose from the gear thereby releasing the gear and the parts fixedly connected therewith for rotation by and together with shaft 14.

The operation of drive motor 12 can further be controlled by a second bar 44 which at one end is connected to a latch 45 constructed and positioned to engage gear 46 of the gear train of the motor, thereby arresting the entire drive mechanism.

The free end of bar 44 is also connected to the control panel 25 and connected to a handle 47 so that operation of this handle will cause axial movement of bar 44 in either direction, thereby releasing or arresting motor 12.

For the purpose of protecting the drive mechanism and enhancing the ornamental appearance of the toy, the drive and control mechanism of the toy is covered by a hollow body 50 which may have the outer appearance of a simulated mountain formation. The upper open end of mountain formation 50 is covered by a cap 51 also simulating a mountain formation. Cap 51 is mounted axially slidably and rotatably relative to hollow body 50 and fastened to standard 31 as can best be seen in Fig. 2, so that it will rotate together with the standard.

An axial elongated slot 52 is provided in cap 51 to permit a pivotal movement of the sleeve holder 33 and with it of sleeve 34 and rod 35.

As will be apparent, the only parts of the drive and control mechanism that are visible from the outside are sleeve holder 33 and sleeve 34 in which rod 35 is inserted.

It should be noted in this connection that hollow bodies 50 and 51 can of course have any other suitable shape, for instance the shape of the control tower of an airport.

The operation of the illustrated embodiment of a mechanical toy according to the invention is as follows:

Let it be assumed that spring 13 is wound, that the drive motor is arrested by latch 45 being placed in engagement with gear 46, and that latch 40 is released from gear 30. When the operator, such as a child, now desires to play, it releases the motor by operating handle 47 accordingly. As a result, drive shaft 14 begins to rotate, thereby causing rotation of standard 31. Rotation of the standard in turn effects rotation of gear 30 and collar 16 both fixedly connected to standard 31. The rotation of the standard further causes rotation of cap 51 and of the sleeve holder 33 with the sleeve 34. As a result, a substantially cone-shaped rotation will be imparted to rod 35, the top end of the drive shaft constituting the approximate apex of the cone. Hence, airplane 36 supported on the outer end of rod 35 will travel along a circular path. When gear 30 is released and hence rotated by shaft 14 together with standard 31, cap 51, sleeve holder 34 and pivot bearing 32, the rod 35 will not rotate about its own axis in spite of the lower end of spring 37 being secured to drive shaft 14 by reason of the fact that gear 30 and the parts supported thereon rotate with the same speed as shaft 14 so that there is no relative rotation between shaft 14 and gear 30 causing an axial rotation of spring 37 and rod 35. When the child now desires to cause the airplane to climb or descend, he can accomplish this purpose by manipulating hand wheel 24. A rocking of this wheel will result in an axial lowering or raising of gear 30 as indicated in Fig. 1 by dotted lines and in a corresponding change of the angular position of rod 35 as also indicated in dotted lines. It will be apparent that a vertical raising or lowering of gear 30, say a lowering, will result in a corresponding lowering of the parts supported by gear 30, namely standard 31, cap 51, bracket 33, and pivot bearing 32. It will further be apparent that the vertical position of the end of spring 37 which is secured to the upper end of shaft 14 remains unchanged by a lowering of gear 30, the said gear being slidable on the shaft. Consequently, the lowering of gear 30 will result in a decrease of the vertical distance between the pivot bearing 32 and the lower end of the spring secured to shaft 14 which decrease, in turn, effects a downward tilting of rod 35. Similarly, a raising of gear 30 entailing raising of pivot 32 will result in a corresponding upward tilting of rod 35. As will be evident, a lowering of gear 30 will cause the airplane to climb and vice versa.

In case the child wishes to interrupt the rotary flight of the airplane and to cause the same to fly through one or more loops, he simply manipulates handle 43 so that gear 30 is arrested while shaft 14 continues to rotate. As a result, rotation of standard 31, cap 51 and with it rotation of sleeve holder 34 about the longitudinal axis of the cone, previously mentioned, are stopped. Drive shaft 14 which continues its rotation will now rotate sleeve 34 and with it rod 35 about its axis. The child can then cause loop flight of the airplane by corresponding manipulation of hand wheel 24.

When the child desires to stop the entire drive mechanism, he again simply operates handle 47.

While the invention has been described in detail with respect to a now preferred example and embodiment it will be understood by those skilled in the art after understanding the invention, various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims, to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. A propulsion and control unit for a tethered aircraft toy comprising drive means including a vertical drive shaft, a rod for supporting on one end a dummy aircraft, support means frictionally fitted upon said vertical drive shaft so as to provide for axial up and down displacement of the support means relative to the drive shaft

and for rotation of the drive shaft in unison with the support means or relative thereto, bearing means rotatably supporting the rod and pivotally supported on the support means for rotational and up and down movement of the bearing means in unison with the rotational or up and down movement of the support means and for pivotal movement of the bearing means relative to the axis of the vertical drive shaft, the said bearing means supporting the rod at an intermediate point thereof and at an angle to the axis of the said drive shaft, a flexible member fixedly joining the end of the rod opposite to the dummy supporting end thereof to the said drive shaft for axial rotation of the rod in unison with the drive shaft, adjustment means for adjusting the axial position of the support means and the bearing means supported thereon relative to the drive shaft, the said adjustment means comprising a bracket pivotally mounted for up and down movement relative to the vertical drive shaft and slidably engaging the support means for axially displacing the latter on the drive shaft thereby varying the vertical distance between the pivot point of the bearing means and the point at which the flexible member is secured to the drive shaft and hence the angle of the rod relative to the drive shaft, and control means releasably engageable with the support means for arresting the same relative to the drive shaft or releasing the support means for rotation in unison with the drive shaft whereby the drive shaft upon arrest of the support means rotates the rod about its axis and upon release of the support means rotates the said support means, the bearing means supported thereon and the rod.

2. A unit as defined in claim 1, wherein the said support means comprise a gear means fitted upon said drive shaft, a grooved collar secured to said gear means and fitted upon said shaft, and a frame structure supported by said gear means for rotation in unison therewith and supporting said bearing means; and wherein the said adjustment means comprise a base supporting the drive means, a bracket bifurcated at one end and with its other end pivotally mounted on said base, the prongs of said bracket engaging said collar groove for axial up and down displacement of the collar and the gear means on the drive shaft, and actuating means operatively connected with said bracket for varying the angular position thereof relative to the base thereby varying the vertical distance between the gear means and the base; and wherein the said control means comprise a locking member mounted on said base for movement between a position engaging the teeth of the gear means and a position disengaged therefrom, and

actuating means operatively coupled with the locking member for moving the same from one position into the other, thereby either arresting the gear means and the bearing means supported thereon for rotation of the drive shaft relative to the gear means or releasing the gear means and the bearing means supported thereon for rotation in unison with the drive shaft.

3. A unit as defined in claim 2, wherein the said flexible member is in form of a coil spring secured at one end to the drive shaft and at the other end to the respective end of the rod.

4. A unit as defined in claim 3, in combination with a control panel mounted on said base spaced apart from the drive means; a first control bar extending substantially parallel to said base from the panel to said actuating means for varying the axial position of the gear means relative to the drive shaft and operatively coupled with the said actuating means, a control wheel rotatably mounted on the panel, and transmission means on the panel coupling the control wheel with the first control bar so as to vary the position thereof upon a rotation of the control wheel thereby operating the said actuating means for varying the axial position of the gear means; a second control bar extending substantially parallel to said base from the panel to the actuating means coupled with the locking member and operatively connected at one end with the said actuating means, and a control lever on the panel coupled with the other end of the second control bar for operating the said locking member actuating means by actuation of the control lever; releasable brake means for arresting said drive means; and a third control bar extending substantially parallel to said base from the panel to said brake means and on one end operatively coupled with the latter, and a second control lever on the control panel operatively coupled with the other end of the third control bar for actuating the said brake means by manipulation of the second control lever.

ERNEST FIELDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,406,733	Hinz	Feb. 14, 1922
2,075,267	Christiansen	Mar. 30, 1937
2,149,666	Christiansen	Mar. 7, 1939
2,159,963	Bonanno	May 30, 1939
2,216,899	Berger	Oct. 8, 1940
2,219,653	Pasek	Oct. 29, 1940
2,510,169	Caler	June 6, 1950