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TOY AIRPLANE DEVICE

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This invention relates to new and useful improvements in a toy airplane device. The invention has for an object the construction of a toy airplane device which is characterized by a tower and a plurality of arms associated with the tower in a particular manner, and supporting airplanes—so that the airplanes may "loop-the-loop" as well as circle the tower.

Specifically, the invention contemplates particular mechanism for accomplishing various motions of the airplane.

It is an object of this invention to arrange a vertical hollow shaft rotatively supported in the tower and fixedly supporting a drum, to arrange an internal shaft rotative through the hollow shaft, to support the airplanes indirectly upon the internal shaft, and to provide an arrangement for rotating the drum and for holding the internal or hollow shaft to obtain the motions desired, and also to bring the device to a stop if so desired.

Another object of the invention is the construction of a device as mentioned which is simple and durable and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a plan view of a device constructed according to this invention.

Fig. 2 is a side elevational view of Fig. 1.

Fig. 3 is a fragmentary horizontal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary vertical transverse sectional view of Fig. 2.

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

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is a fragmentary sectional view taken on the line 7—7 of Fig. 1.

Fig. 8 is a plan view similar to Fig. 1 but illustrating a modified construction.

Fig. 9 is a side elevational view of Fig. 8.

Fig. 10 is a transverse vertical sectional view showing another modified form of the invention.

Fig. 11 is a sectional view of another modified form of the invention.

Fig. 12 is a fragmentary horizontal sectional view taken on the line 12—12 of Fig. 11.

The toy airplane device, according to this invention, comprises a hollow tower 10 in which a vertical hollow shaft 11 is rotatively supported. This vertical hollow shaft 11 consists of a bottom section 11a and a top section 11b which extend from the top of the tower 10. These sections 11a and 11b are fixedly connected together by welding. A drum 12 is coaxially fixed on the upper end of the top section 11b. An internal shaft 13 is rotatively supported in the hollow shaft 11 and extends from the top end thereof. A support 14 is rotatively mounted on the extended portion of the internal shaft 13 and is connected with a gear 15 which meshes with gear teeth 16 formed on one edge of the drum 12.

An element 17 is associated with one of the shafts and frictionally cooperates with the other of the shafts to maintain the shafts in frictional engagement with each other when desired. A motor 18 is supported on a bracket 19 which is attached on the tower 10. This motor is provided with a pinion 20 which meshes with gear teeth 21 formed on the other edge of the drum 12.

A radial arm 22 projects from the support 14 and is adapted to support an airplane 23. This radial arm has a longitudinal inner end portion 22a which continues into a transverse intermediate portion 22b which in turn continues into a longitudinal outer end portion 22c. The airplane 23 is attached upon the outer end portion 22c. The connection between the airplane and the radial arm is such that the airplane may bank one way or the other, and may also tilt upwards or downwards. This is accomplished by the arm portion 22c swivelly engaging into a lug 24 of a bracket 25 which is provided with a trunnion 26, the elements of which are at right angles to the arm portion 22c. The body of the airplane is formed with a hollow 23a in which the bracket 25 is disposed. It should be noted that the airplane 23 may turn about the rod portion 22c as a pivot as well as around the trunnion 26 as a pivot which is at right angles to the turning permitted by the arm portion 22c.

A brake is associated with the internal shaft 13 for holding this shaft when desired. This brake comprises a rod 27 extending radially from the tower and provided with a handle 28 at its outer end by which it may be moved. This rod is slidably supported and at its inner end is provided with a brake shoe 29 adapted to engage against a pulley 30 which is fixed upon the shaft 13. Thus, the handle 28 may be moved to engage the brake shoe 29 against the pulley to hold the internal shaft.
The hollow tower 10 includes a hollow pedestal portion 10a to which a hollow tubular portion 10b is connected. A substantially spherical portion 10c is mounted upon the upper portion 10a and encases the motor 18, the drum 12 and the other parts in this vicinity. A bracket 33 projects from the upper end of the internal shaft 13 and supports a ball 34 upon which a flag or pennant 35 is mounted. A shell shaped cover 36 is supported on the ball 35 and cooperates with the spherical portion 10b of the tower to encase the operative mechanism of the device. The drum 12 is formed with a transverse partition 12a which has a hub portion engaging the upper end of the hollow shaft 11. Several screws 12b serve to fixedly attach the hub portion of the drum with the hollow shaft. Several thrust bearings 38 are interposed between the internal shaft 13 and the hollow shaft 11 for rotatively connecting these shafts together. The support member 14 is provided with an arm 39 extending in the opposite direction to the arm 22. A counterweight 40 is mounted upon the end of the arm 39 and is for the purpose of counterweighting the airplane 23. A brake drum 41 is provided for stopping rotations of the hollow shaft 11 and comprises a brake drum 41 fixed upon the bottom end of the hollow shaft 11 and cooperative with a brake shoe 42 mounted upon the rod 27 but diametrically opposite to the brake shoe 23. Thus, the rod 27 may be moved in one direction for applying one brake, or in the other direction for applying the other brake.

The operation of the device is as follows:

Rotations from the motor 18 will be transmitted to rotate the drum 12 and thus the hollow shaft 11. The friction element 17 will cause the internal shaft 13 to rotate along with the hollow shaft 11 and consequently the support 14 will turn around the tower as a center. Thus, the airplane 23 is carried around the tower. The brake 29 may be applied partially or completely. If partially applied the internal shaft 13 will turn at a different rate than the hollow shaft 11, and a portion of the rotations of the drum 12 will be transmitted to turn the gear 19 and rotate the support 14. The airplane 23 will then loop-the-loop in addition to its motion around the tower. If the brake is completely applied the airplane will merely loop-the-loop. The dotted and dash lines in Fig. 2 illustrate another position of the airplane during the looping action. If the brake 42 is applied the entire device is brought to a stop. Of course, the motor 18 must be cut.

In Figs. 8. and 9 a modified form of the invention has been disclosed which distinguishes from the prior form merely in the construction of the brake. In this form of the invention a frame 50 is mounted upon the ground and connected with the side of the pedestal portion 10a of the tower. The rod 27 is slidable in this frame. A lever 28a is pivotally mounted at its bottom end 28b upon the frame 50 and the rod 27 has a bent end 27a connected intermediate of the lever 28a. Thus, the lever may be pivoted in one direction or the other to apply the brakes.

In Fig. 10 another form of the invention has been disclosed which distinguishes from the prior form merely in the construction of the brake. The auxiliary arm 39 supports a counterweight 40f for the airplane. This counterweight is threaded in association with the rod 39, so that it may be adjusted to various positions to compensate for loads carried by the airplane. Furthermore, in this device a rheostat 81 is provided for the purpose of controlling the speed of the motor 18. The wiring is not illustrated on the drawings since it forms no part of the invention. A further variation is in the fact that merely the internal shaft 13 is provided with the brake 29, 30. In other respects this form of the invention is identical to the previous form and similar parts may be recognized upon reference numerals.
When the handle 88 is pulled further to the right the rod 83 will be moved against the restraining action of the springs 75 and 84 and soon one of the brakes 76 will engage the wheel 71. Then the internal shaft 64 is reduced in speed or completely fixed. Since the support member 65 is connected with the internal shaft 64 it will be reduced in speed or held, consequently the drive disc 67 which is moving along with the hollow shaft 63 will now rotate the disc 68 and cause the arm 69 to rotate and loop-the-loop the airplane 65. When the handle 88 is moved towards the left the motor 62 will pivot so that the drive pinion 73 engages the flange 70. The device will now be rotating in the opposite direction. When the brake 76 re-engages the brake wheel 71 the airplane will be caused to loop-the-loop.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A toy airplane, comprising a hollow tower, a vertical hollow shaft rotatively supported in said tower, a drum coaxially fixed on the upper end of said hollow shaft, an internal shaft rotatively supported in said hollow shaft and extending from the top thereof, a support member rotatively mounted on the extended portion of said internal shaft and connected with a gear meshing with gear teeth on said drum, an element causing frictional engagement of said shafts, a motor driving said drum, a radial arm projecting from said support member for supporting an airplane, and a brake for holding said internal shaft against rotation.

2. A toy airplane, comprising a hollow tower, a vertical hollow shaft rotatively supported in said tower, a drum coaxially fixed on the upper end of said hollow shaft, an internal shaft rotatively supported in said hollow shaft and extending from the top thereof, a support member rotatively mounted on the extended portion of said internal shaft and connected with a gear meshing with gear teeth on said drum, an element causing frictional engagement of said shafts, a motor driving said drum, a radial arm projecting from said support member for supporting an airplane, and a brake for holding said internal shaft against rotation, said tower including a hollow pedestal, a tubular intermediate portion, and a hollow spherical top encausing the drum and other parts of the device.

3. A toy airplane comprising a hollow tower, a vertical hollow shaft rotatively supported in said tower, a drum coaxially fixed on the upper end of said hollow shaft, an internal shaft rotatively supported in said hollow shaft and extending from the top thereof, a support member rotatively mounted on the extended portion of said internal shaft and connected with a gear meshing with gear teeth on said drum, an element causing frictional engagement of said shafts, a motor driving said drum, a radial arm projecting from said support member for supporting an airplane, and a brake for holding said internal shaft against rotation, comprising a brake shaft fixed on the shaft, a rod slidably mounted and provided with a brake shoe engageable against the brake drum, and an element by which the rod may be moved.

4. A toy airplane comprising a hollow tower, a hollow shaft rotative through said tower, an internal shaft rotative through said hollow shaft, a support member fixed on an extended end of said internal shaft, a loop-the-loop airplane mechanism rotatively mounted on said support member, a drive for said loop-the-loop airplane mechanism connected with said internal shaft, a flanged wheel on said hollow shaft, a brake wheel on the other end of said internal shaft, a motor movably supported and having a drive pinion engageable against the flanges of said flanged wheel, a mechanism for manually moving said motor including a resilient element, and a brake associated with said resilient element and engageable with said brake wheel.

5. A toy airplane comprising a hollow tower, a hollow shaft rotative through said tower, an internal shaft rotative through said hollow shaft, a support member fixed on an extended end of said internal shaft, a loop-the-loop airplane mechanism rotatively mounted on said support member, a drive for said loop-the-loop airplane mechanism.
mechanism connected with said internal shaft, a flanged wheel on said hollow shaft, a brake wheel on the other end of said internal shaft, a motor movably supported and having a drive pinion engageable against the flanges of said flanged wheel, a mechanism for manually moving said motor including a resilient element, and a brake associated with said resilient element and engageable with said brake wheel, and comprising a pair of brake shoes arranged on opposite sides of said brake wheel, an operator rod connected with said brake shoes and constituting an operator for said mechanism for manually moving the motor, whereby when the rod is moved in one direction one of the brake shoes engages the brake wheel, and when moved in the other direction the other brake shoe engages the brake wheel.

9. A toy aeroplane, comprising a hollow tower, a vertical hollow shaft rotatively supported in said tower, a drum coaxially fixed on the upper end of said hollow shaft and having gear teeth thereon, an internal shaft rotatively supported in said hollow shaft and having a portion extending from the top thereof, a support member rotative on said extended end and connected with a gear meshing with said gear teeth, a source of power adapted to rotate said drum, a pair of diametrically opposite radially extending arms, projecting from said support member, an aeroplane mounted on one of said arms, a brake mechanism adapted to retard the rotating motion of said inner shaft to permit said aeroplane to loop-the-loop, and a weight on the other of said arms to counterbalance the weight of said aeroplane so as to require less force to make said aeroplane loop-the-loop.

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