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AMUSEMENT APPARATUS

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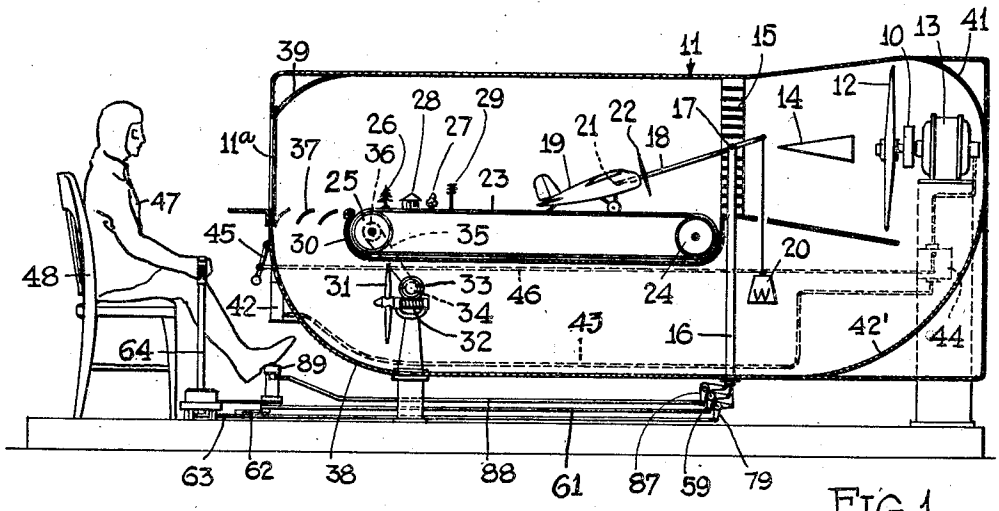

FIG. 1.

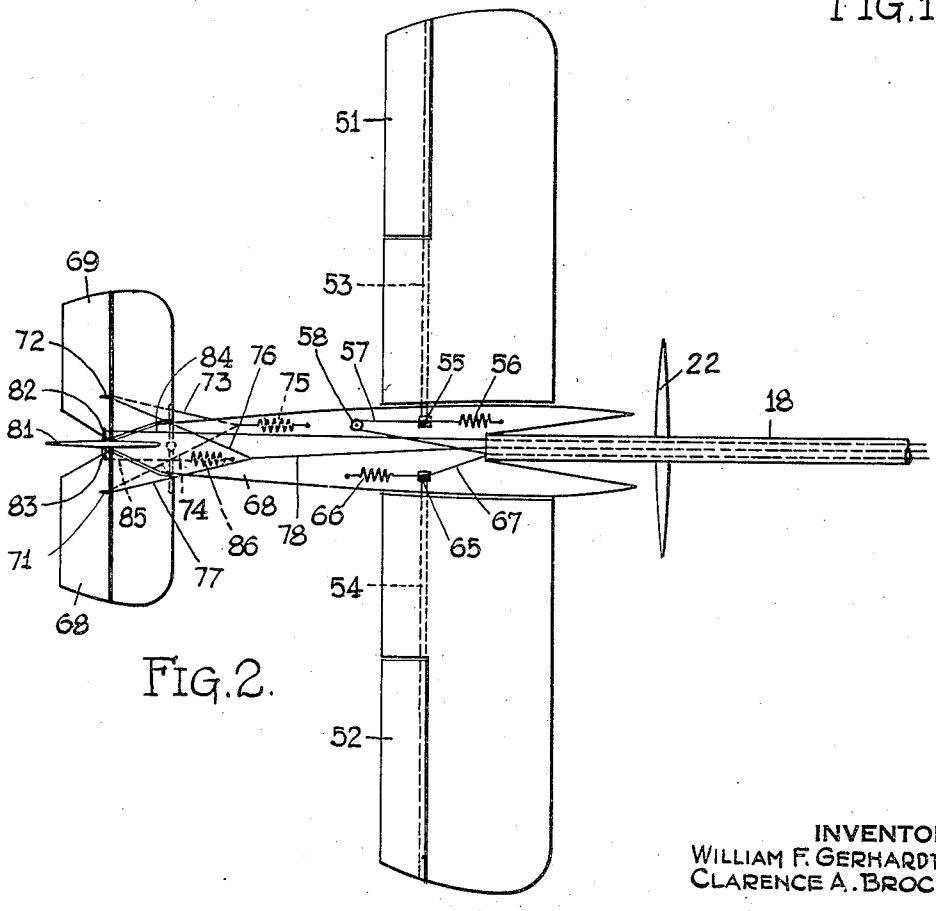

FIG. 2.

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AMUSEMENT APPARATUS

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Serial No. 563,722

13 Claims. (Cl. 35—12)

The present invention relates to an amusement apparatus. Specifically, it represents an improvement on the device shown in our copending application, Serial Number 413,747, filed December 13, 1929.

One of the objects of the invention is to provide an amusement apparatus in which the operator is enabled to control a miniature aerial vehicle by full sized controls.

A further object of the invention is to provide in an apparatus of the above described character an enclosure for the miniature aerial vehicle and an air stream in which the vehicle flies wholly within an airtight casing.

A further object of the invention is to provide in a device of the above character means for creating the illusion that the aerial vehicle is flying over a landscape which also appears in miniature.

A further object of the invention is to improve the apparatus disclosed in said copending application so that fewer control cables are necessary.

A still further object of the invention is to provide an apparatus in which the aerial vehicle may be steered from side to side as well as flown straight forward.

Further objects will be apparent from a reading of the subjoined specification and claims and from a consideration of the accompanying drawing.

In order to explain the invention more clearly, one embodiment thereof is shown in said drawing, in which:

Fig. 1 is a view in side elevation with parts in section of an apparatus constructed according to the present invention; and

Fig. 2 is a view in plan of the airplane used in the above described apparatus, showing particularly the control hook-up.

In general, the device used for illustration of our invention is similar to that disclosed in our copending application, Serial Number 413,747, above referred to, with the following differences. The air stream created by the fan instead of passing continuously through the tunnel and out past the operator, passes continuously round and round a closed tunnel. The use of a closed tunnel results in the provision of a continuous circuit of air since the blast of air cannot escape and also allows a reduction in the size of the motor and thus the operating expense and the noise are both reduced. Moreover, a moving carpet is provided on which there is represented a landscape so as to create the illusion that the airplane is flying over said landscape. Furthermore, the airplane is carried on a support which extends directly forward from the airplane and is mounted for universal movement so that the airplane may move from side to side as well as execute other maneuvers.

Referring particularly to the drawing, we have shown in Fig. 1 a closed wind tunnel 11 which is provided as far as possible with insulation but at certain points such as 11ª it is provided with transparent members so that the model and carpet may be seen. The wind tunnel 11 is provided with a fan 12 for creating a blast of air driven by an electric motor 13. A weighted fly wheel 10 is provided on the shaft of the motor 13 to cause a gradual starting and stopping of the air stream. In advance of the fan 12 is provided a cone 14 for aiding in eliminating eddies from the air stream and straighteners 15 are also provided for aiding in straightening the air flow. Substantially in line with the straighteners 15 is a substantially vertical tube 16 mounted in bearings for rotation substantially about its vertical axis. At the upper end of this tube 16 there is carried on pivots 17 a tubular lever 18 to one end of which is attached the model airplane 19. It is to be noted that the tubular lever 18 is attached to the airplane 19 at a point 21 which is substantially the center of gravity of the airplane. Moreover, the tubular lever 18 is attached to the airplane 19 by a universal joint so that the airplane 19 may move universally with regard to the tubular lever 18. It is necessary, therefore, that the front of the airplane shall have (see Fig. 2) a substantially cone-shaped opening cut therein so as to allow side to side and vertical movement of the tubular lever 18 relative to the airplane 19. The opposite end of the tubular lever 18 is connected to a weight 20 which nearly but not quite counterbalances the weight of the airplane. A propeller 22 for the airplane 19 may be mounted on the tubular lever 18 or may be omitted if desired. The airplane 19 is adapted to land upon a movable carpet 23 which is adapted to travel over rollers 24 and 25. The carpet 23 may be provided with representations of objects appearing on the landscape such as trees 26 and 27, houses such as 28, and telephone poles such as 29. The objects are hingedly mounted but are normally balanced to stand upright. However, a guard 30 causes them to fold on the under side of the carpet to prevent interference with the air flow.

The carpet is adapted to be driven by the air stream created by the fan 12. To this end an impeller 31 is mounted in the tunnel beneath the movable carpet and drives a worm screw 32 which in turn drives a worm wheel 33. The worm wheel

33 is mounted on a shaft which carries a pulley 34 and around the pulley 34 is a belt 35 having its opposite end passed around another pulley 36 mounted on the same shaft as the roller 25.

In addition to the straighteners 15 and the cone 14 curved baffles such as 37 may be provided for aiding and straightening the air flow. The form of the tunnel adjacent to the corners is preferably curved as shown at 38 and partitions such as 39, 41 and 42' may be provided for a similar purpose.

We desire that the apparatus shall be capable of coin control and to that end provide a coin box 42. This coin control is adapted to operate an electrical relay 43 which leads to a switch box 44 and enables the motor 13 to be operated by means of a throttle lever 45 also controlling the switch box 44 through a link 46.

As in our former application the operator 47 seated in a chair 48 may manipulate the control surfaces of the model airplane through full sized controls. The ailerons 51 and 52 of the model airplane (see Fig. 2) are mounted on shafts 53 and 54. A horn 55 connected to the shaft 53 is urged in one direction by a spring 56 and may be moved in the opposite direction by a cable 57 which extends rearwardly over a pulley 58 and then forward through the tubular lever 18 to the pivot 17, then down through the tube 16 to a connection with a bell crank 59. A link 61 connects the bell crank 59 with another bell crank 62 adjacent to the pilot's seat 48. The opposite end of the bell crank 62 is connected to a link 63 connected to the bottom of a control stick 64. Thus movement of the control stick to one side swings the link 63, moves the bell crank 62, pulls back on the link 61, turns the bell crank 59, pulls the cable 57 and thus turns the shaft 53 and the aileron 51. Movement of the stick in the opposite direction allows the spring 56 to turn the shaft 53 and the aileron 51 in the opposite direction. A horn 65 mounted on the shaft 54 corresponds to the horn 55 and a spring 66 acts to urge the shaft 54 in the opposite direction to which the shaft 53 is urged. A cable 67 connects the horn 65 with the cable 57 and thus operates the aileron 52 simultaneouly with the aileron 51 but in the opposite direction.

Elevators 68 and 69 are provided with horns 71 and 72. These horns extend both above and below the elevators. To the under projections of said horns are connected cables 73 and 74 which are joined and connected to a spring 75 which thus normally urges the elevators downward. However, the upper parts of the horns are connected by cables 76 and 77, respectively, to a common cable 78 which extends forward through the tube 18 to the pivot 17, then over suitable pulleys and down through the tube 16 to a connection with a bell crank 79. The lower end of the bell crank 79 is connected with the link 63 so that backward movement of the stick 64 causes a pull on the cable 78, the cables 76 and 77 and a raising of the elevators 68 and 69 against the action of the spring 75. A movement forward of the stick 64 allows the spring 75 to move the elevators 68 and 69 downward. A rudder 81 has a pair of horns 82 and 83 on opposite sides thereof to which are connected cables 84 and 85, respectively. The cable 85 is connected to a spring 86 secured to the fuselage of the model airplane, and the cable 84 extends forward through the tube 18 over suitable pulleys and down through the tube 16 to a connection with a bell crank lever 87. The lower end of the bell crank lever 87 is connected to a link 88 which extends rearwardly to a connection to one side of the rudder bar 89. Thus movement of the rudder bar 89 in one direction pulls on the cable 84 and turns the rudder clockwise as shown in Fig. 2, while a movement of the rudder bar in the opposite direction allows the springs 86 to turn the rudder 81 counter-clockwise as shown in Fig. 2.

It is thought that the operation of the device used for illustration of our invention will be apparent from the above description. The operator sits in the chair 48 and after depositing a coin in the box 42 moves the throttle 45 to turn on the switch 44 and thus energizes the motor 13 to drive the propeller fan 12. This causes a current of air to flow in a continuous circuit counter-clockwise through the tunnel rearwardly over the moving belt and then forwardly under the belt. This current of air acts upon the lifting surfaces of the airplane, and inasmuch as the airplane is nearly balanced by the weight 20 causes the airplane to rise from the carpet and fly. The operator manipulates the control surfaces through the control stick 64 and the rudder bar 89 and thus flies the airplane in any direction desired. The airplane may move from side to side on account of the bearings for the tube 16 and may move up and down on account of the hinged joint 17. It may bank and execute a roll by reason of the universal joint 21 and also may dive or climb by reason of said universal joint. However, the amount of turning and diving or climbing is limited by the sides of the conically shaped opening in the front part of the fuselage. The current of air flowing through the tunnel causes the impeller 51 to turn, thus turning the worm shaft 32 and driving the roller 25 through the belt 35. This causes the belt 23 to move relatively slowly and causes the appearance that the airplane is flying over the landscape as shown by the moving carpet. The objects, such as 26, 27, 28 and 29 pass rearwardly and as they reach the guard 30 turn on their hinges and in passing rearwardly lie flat against the belt. However, when they reach the forward end of the belt they are again raised to their upright position by gravity and the fact that the pivots therefor are suitably arranged.

It is to be understood that the above described embodiment of the invention is for the purpose of illustration only, and various changes may be made therein without departing from the spirit and scope of the invention.

We claim as our invention:

1. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, and a closed tunnel in which said model is mounted.

2. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, and a moving carpet having a landscape depicted thereon over which said model is adapted to fly.

3. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, and a lever arm connected to the front of said model and extending forward to a pivot on said apparatus for aiding in supporting said model.

4. In an amusement apparatus, a model of an

aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, said controlling means including a cable connected to said control surface, a spring also connected to said control surface and urging the control surface in an opposite direction from that toward which the cable is adapted to arrange it, and means for connecting the cable to the full sized control.

5. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, and means for causing a stream of air to flow past said model comprising an electric motor, a fan driven by said motor and a weighted fly-wheel also driven by said motor whereby the starting and stopping of the air stream is made more gradual.

6. In an amusement apparatus, a model of an aerial vehicle having control surfaces, means for actuating said control surfaces, means for causing a blast of air to flow past said model, a carpet having a landscape depicted thereon over which said model is adapted to fly, and means for moving said carpet, said last mentioned means being actuated by said blast of air.

7. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, a moving carpet having a landscape depicted thereon over which said model is adapted to fly, and means for collapsing said landscape against the lower run of said carpet.

8. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, and a closed tunnel in which said model is mounted, said tunnel having an observation window therein.

9. In a model of an aerial vehicle having wings, ailerons hinged to said wings, resilient means on each said aileron urging each said aileron toward its extreme position of adjustment, and control means adjustable to move said ailerons against said resilient means, whereby the left said aileron is depressed simultaneously with elevation of the right said aileron, and whereby the left said aileron is elevated simultaneously with the depression of the right said aileron.

10. In amusement apparatus, a model of an aerial vehicle, means for causing a blast of air to flow past said model, a moving carpet, figures hinged on said carpet, means for collapsing said figures against the lower run of said carpet, said figures being adapted to become erect upon their emergence from the lower run of said carpet.

11. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, a closed tunnel in which said aerial vehicle is adapted to fly, an observation window mounted in said tunnel, and blast creating means within said tunnel for causing a blast of air to flow past said model.

12. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for movng said control surfaces, a closed tunnel in which said aerial vehicle is adapted to fly, an observation window mounted in said tunnel, blast creating means within said tunnel for causing a blast of air to flow past said model, a moving carpet over which said aerial vehicle is adapted to fly, and means actuated by said air blast for moving said carpet.

13. In an amusement apparatus, a model of an aerial vehicle, control surfaces therefor, means comprising full sized controls located at a distance from said aerial vehicle for moving said control surfaces, a closed tunnel in which said aerial vehicle is adapted to fly, an observation window mounted in said tunnel, blast creating means within said tunnel for causing a blast of air to flow past said model, and a moving carpet defining in said tunnel a channel in which said aerial vehicle is adapted to fly and an air return duct.

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