Dec. 15, 1942. M. N. TIGERMAN 2,305,207

AMUSEMENT DEVICE

Filed Nov. 15, 1941 3 Sheets-Sheet 1

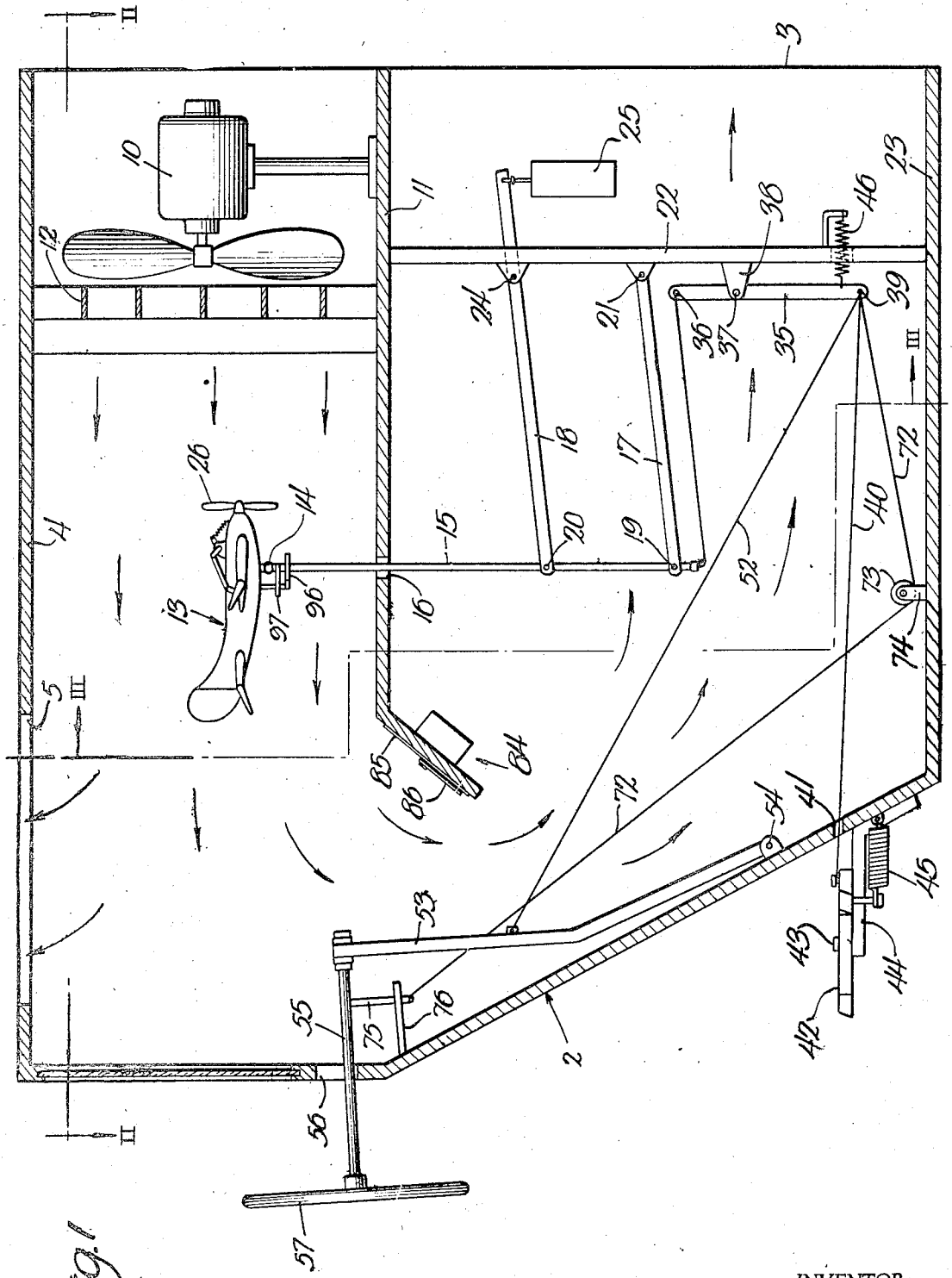


Fig. 1.

INVENTOR.
Milton N. Tigerman
BY Benjamin Schlosser
ATTY.

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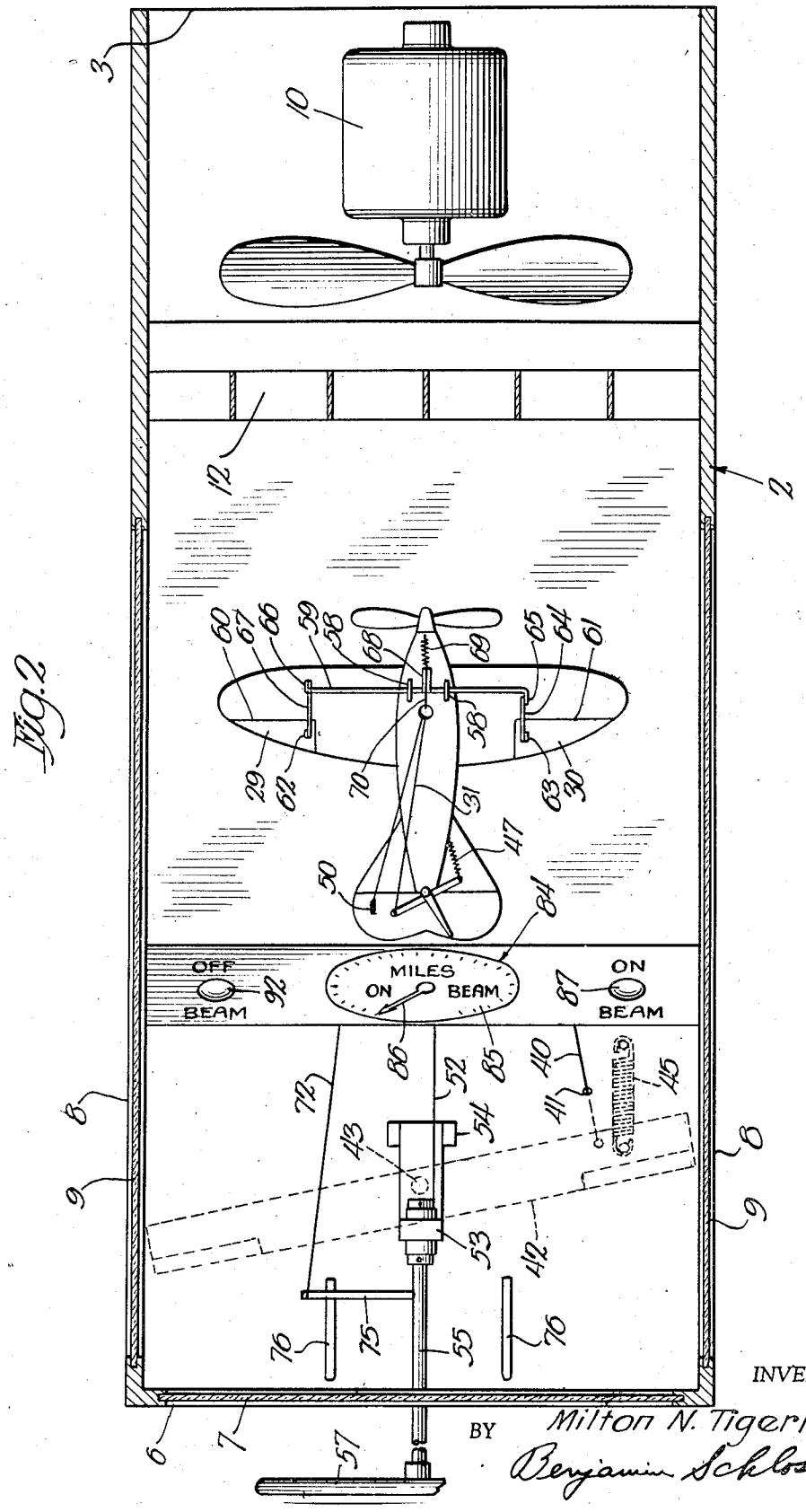


Fig. 2

INVENTOR.

BY Milton N. Tigerman

Benjamin Schlosser ATTY.

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Fig. 3

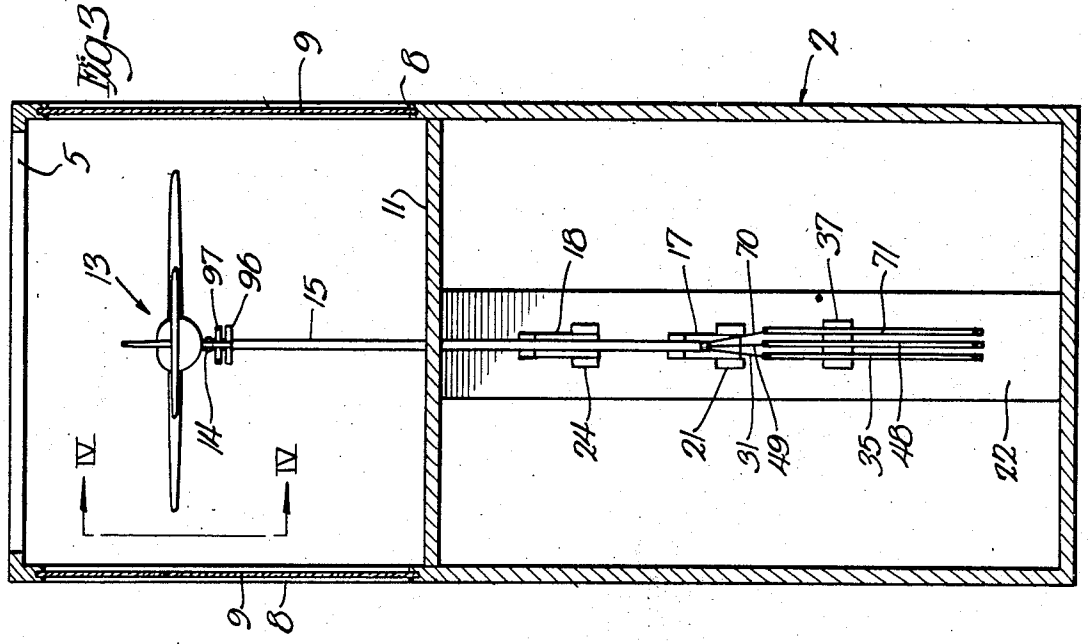


Fig. 4

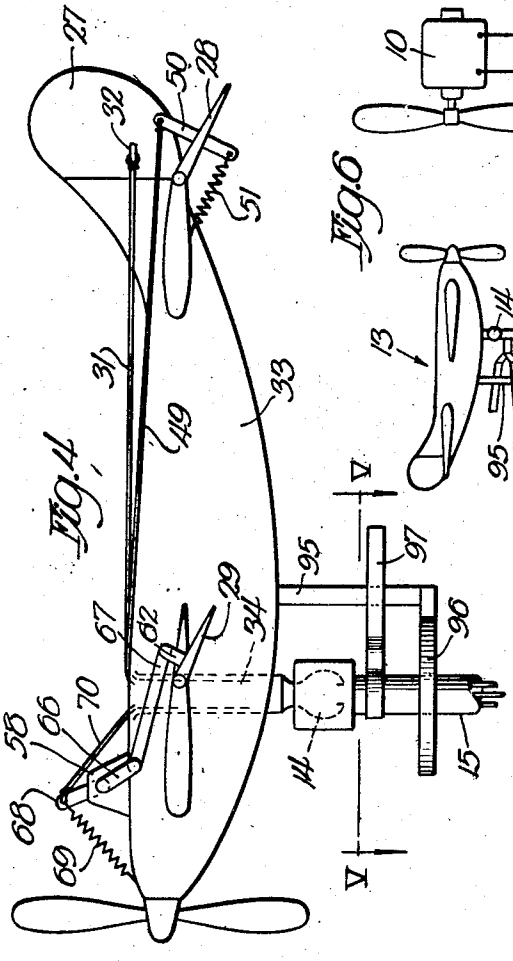


Fig. 6

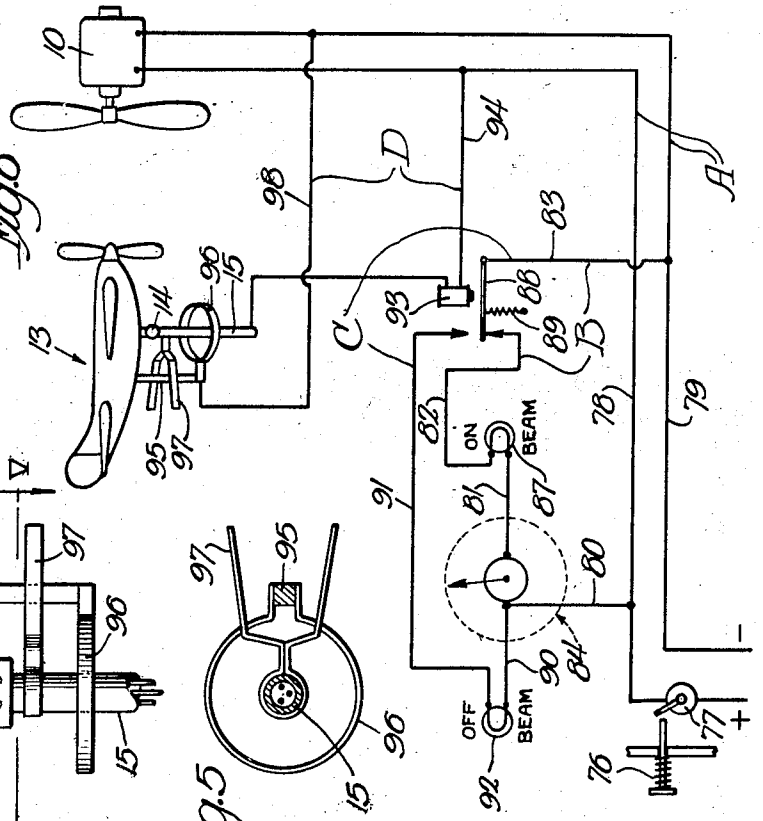


Fig. 5

INVENTOR.
Milton N. Tigerman
BY
Benjamin Schlosser
ATTY.

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UNITED STATES PATENT OFFICE

2,305,207

AMUSEMENT DEVICE

Milton N. Tigerman, Chicago, Ill.

Application November 15, 1941, Serial No. 419,273

7 Claims. (Cl. 35—12)

This invention relates to an amusement device which simulates an airplane in flight and which has some actual value in teaching the user of the device coordination of hands and feet in order to maintain an airplane on the beam during the period it is in flight.

It is an object of my invention to provide independently operated control means for controlling separately movable members to maintain them in predetermined relationship against forces tending to disturb said relationship.

It is a further object of my invention to provide automatic means for indicating whether or not the movable members of a device simulating an airplane in flight are being maintained in the required relationship, and scoring means automatically accumulating and registering the total periods of time during one flight that the movable members are maintained in the required relationship.

Other objects of my invention will become apparent upon reading the following description, taken in conjunction with the accompanying drawings, in which

Figure 1 is a cross sectional view illustrating one embodiment of my invention;

Figure 2 is a cross sectional view taken along the line II—II of Figure 1;

Figure 3 is a cross sectional view taken along the line III—III of Figure 1;

Figure 4 is a side elevation taken along the line IV—IV of Figure 3;

Figure 5 is a cross sectional view taken along the line V—V of Figure 4; and

Figure 6 is a diagrammatic illustration of the electrical circuits controlling the indicating and scoring means.

In the drawings, the reference numeral 2 indicates a cabinet having an open back 3. The top 4 of the cabinet has an opening 5 cooperating with the open back 3 to provide an air outlet for the cabinet. The front wall 6 is provided with a window 7 and the side walls 8 are provided with windows 9 to provide visibility and to enhance the attractiveness of the device. An electric fan 10 mounted on a shelf 11 in the cabinet provides a blast of air which flows through the cabinet and out the opening 5 and the open back 3. A screen 12 may be mounted in front of the fan.

A miniature airplane 13 is mounted, by means of a universal joint 14, on one end of a tubular metal rod 15 which passes through an aperture 16 in the shelf 11. The rod 15 is movable vertically and is supported by means of a pair of parallel links 17 and 18 which are pivotally connected to the rod, as indicated at 19 and 20, respectively. The link 17 is pivotally connected at its other end, as indicated at 21, to a supporting member 22 extending from the base 23 of the cabinet to the shelf 11. The other link 18 is pivoted adjacent its end, as indicated at 24, to the supporting member 22, but extends beyond the supporting member and is provided at its end with a weight 25 provided to counterbalance most of the weight of the airplane 13 and the tubular rod 15. The counterweight is adjusted so that the airplane will sink to the shelf 11 when the fan is not operating, but will rise easily when the fan blows a current of air through the apparatus.

The airplane 13 is provided with a propeller 26 freely rotatable in the air. The airplane is also provided with a rudder 27, an elevator 28, and ailerons 29 and 30, all movable in a manner similar to that of a real airplane by control means hereinbelow described.

A control line 31 is secured to one side of the rudder, as indicated at 32. The line 31 passes over the fuselage 33 and through a passageway 34 which connects with the interior of the tubular rod 15. The line 31 passes through the tubular rod 15 and is secured adjacent one end of a link 35, as indicated at 36. The airplane is provided with a pair of fins 28' and a pair of wings 131. The link 35 is pivoted, at a point 37, to a bracket 38 projecting from the supporting member 22. The pivot point 37 is spaced closer to the end 36 of the link 35 than to its other end 39 so that the amplitude of motion applied to the end 39 is decreased at the end 36. A control line 40 secured to the end 39 passes through an aperture 41 in the front 6 of the cabinet and is secured to one side of a foot operated lever 42 pivoted, as indicated at 43, to a bracket 44 secured to the front wall 6.

A spring 45 exerts a constant force urging the right hand portion of the lever 42 forward. Another spring 46 urges the end 39 of the link 35 forward, and a third spring 47 urges the rudder 27 towards the right, looking at the apparatus from the position occupied when operating the apparatus, so that there is no slack in either control line 40 or 31. The rudder 27 can not be maintained in position to keep the airplane pivoted in a straightforward direction except by a positive force applied to the foot operated lever 42 against the action of the springs 45, 46 and 47.

The elevator 28 is connected to one end of a lever 48, similar to the lever 35, by means of a

control line 49. The line 49 is not connected directly to the elevator 28, but is connected to one end of a lever 50 rigidly secured intermediately of its ends to the elevator. The other end of the lever 50 has secured thereto a spring 51, connected at its other end to one of fins 28' which is mounted on the fuselage 33, which exerts a constant force urging the elevator downwardly. The lower end of the lever 48 is also provided with a spring (not shown) similar to the spring 46. A control line 52 connects the other end of the lever 48 to an intermediate portion of a lever 53 pivoted at one end to a bracket 54 projecting from the inner surface of the front wall 6. The other end of the lever 53 is journaled to a rod 55 which passes through an aperture 56 in the front wall 6 and is provided at its other end with a wheel 57. The operator may raise the elevator by pulling the wheel 57 forward against the action of the spring 51 and the spring (not shown) similar to the spring 46. The wheel 57 may be rotated to the right or left without affecting the position of the lever 53.

The fuselage 33 is provided with a pair of brackets 58, and a cross bar 59, rotatably mounted in the brackets 58, extends a substantial distance across the wings. The ailerons 29 and 30, hinged to the wings as indicated at 60 and 61 respectively, are provided with brackets 62 and 63, respectively. A link 64, secured at one end to the stud 63, connects the aileron 30 directly to the end 65 of the cross bar 59 which is bent towards the stud 63, as seen in Figure 2. The opposite end 66 of the cross bar 59 is bent away from the stud 62, and is connected thereto by means of a link 67 in such a manner that when the cross bar 59 is rotated to move the aileron 30 in either direction the aileron 29 will be moved in the opposite direction.

The cross bar 59 is provided with an arm 68 rigid therewith. A spring 69 urges the arm 68 forward. A control line 70 secured to the end of the arm 68 passes through the passageway 34 and the tubular rod 15 and is secured to one end of a lever 71 similar to the levers 35 and 48. The lower end of the lever 71 is provided with a spring (not shown) similar to the spring 46. A control line 72, secured to the lower end of the lever 71, passes under a roller 73 mounted in a bracket 74 secured to the base 23 of the cabinet and is secured to an arm 75 which projects radially from the rod 55. Rotary motion applied to the wheel 57 is transmitted through the arm 75, control line 72, lever 71 and control line 70 to the arm 68 so as to move the ailerons 29 and 30 against the action of the spring 69 and the spring (not shown) similar to the spring 46. Stop members 76 project inwardly from the front wall 6 to engage the arm 75 to limit the rotary motion of the wheel 57 in either direction.

The operation of the apparatus is started by means of a plunger 78 (Figure 6) which actuates a timer 77 connected to a primary circuit A. The plunger 78 may be a conventional coin operated device or may be a simple push button. The timer closes the circuit A for a predetermined length of time, such as one minute, and then automatically breaks the circuit. The circuit A comprises the wires 78 and 79 which are connected to a suitable source of electric current and energize the fan 10 for the required period of time representing a single flight of the airplane.

When the airplane is maintained in the position indicated diagrammatically in Figure 6 a secondary circuit B is closed. The circuit B comprises the wires 80, 81, 82 and 83. The wire 80 passes from the wire 78 to a recording scoring device 84 of any conventional style. The particular scoring device illustrated comprises a dial 85 and a pointer 86. Electrical current passing through the scoring device 84 causes the pointer 86 to rotate clockwise and, since current passes through the scoring device only when the airplane is maintained in the particular position indicated in Figure 6, the distance the pointer 86 travels around the dial 85 will indicate the total accumulated length of time that the airplane has been maintained in the required position during the particular flight. The pointer 86 is automatically set back to zero by any suitable mechanism when the timer 77 is actuated by the plunger 76. The dial 85 is preferably marked off to represent units of distance so that a comparison of various flights may be easily made.

The wire 81 passes from the scoring device 84 to a green light 87. The wire 82 passes from the green light to a switch 88. The switch 88 is connected to the wire 83 and is held in contact with the wire 82 by means of a spring 89. From the foregoing it will be seen that the green light 87 is lit whenever the circuit B is closed and remains lit until the circuit is broken.

A circuit C shown open in Figure 6, comprises the wires 80, 90, 91 and 83. The wire 90 by-passes the scoring device 84 and leads from the wire 80 to a red light 92. The wire 91 passes from the red light 92 to the switch 88 so that when the switch is moved from contact with the wire 82 into contact with wire 91 circuit C is closed, the pointer 86 stops moving, the green light goes out and the red light is lit to warn the operator that he is off the beam and that he must manipulate the controls to get back on the beam. It will be obvious that other indicating means, such as bells of different tones may be substituted for the lights, or a bell or buzzer may be used in only one circuit to indicate that that particular circuit is closed.

The switch 88 is moved by means of an electromagnetic relay 93 which is energized by means of a circuit D. The circuit D comprises the wire 94 which leads from the wire 78, through the relay 93, to the tubular metal rod 15. The fuselage 33, which is made of wood, paper or some other non-conducting material, has depending therefrom a metal rod 95 provided with a small collar 96 encircling but spaced from the rod 15. The rod 15 is provided with a bifurcated metal member 97 having its arms spaced a small distance on either side of the rod 95 when the airplane is in the position indicated in Figure 6. A wire 98 leads from the rod 95 to the wire 79 and completes the circuit D.

When the airplane is maintained in the position indicated in Figure 6 it will be seen that circuit D is open because there is no contact between the rod 15 and the collar 96 or the rod 95 and the bifuracted member 97. However, as soon as the airplane tilts on the universal joint 14, the collar 96, which is rigid with the airplane, engages the rod 15 to close the circuit D to energize the relay 93 causing the switch 88 to break the circuit B and close the circuit C. If the airplane is maintained on an even keel but is permitted to turn out of its straightforward position the rod 95 will engage one arm of the bifurcated member 97 to close circuit D. As soon as the operator manipulates the controls to cause the airplane to move into the required position the circuits D and C will be broken, and the circuit B,

which moves the scoring pointer, will be closed.

Although I have described one embodiment of my invention in detail, it will be understood that the description thereof is illustrative, rather than restrictive, as many details may be modified or changed without departing from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact details of construction described, except as limited by the prior art and the appended claims.

I claim:

1. In combination, a miniature airplane comprising a fuselage having a plurality of relatively movable members mounted thereon, means operable to control the movement of each of said movable members, and a pair of alternative electrical circuits, one of said circuits being closed when said movable members are maintained in a predetermined relationship and said other circuit being closed when said movable members are not maintained in said predetermined relationship, and signalling means to indicate which of said circuits is closed.

2. In combination, a miniature airplane comprising a fuselage having a plurality of relatively movable members mounted thereon, means operable to control the movement of each of said movable members, a pair of alternative electrical circuits, one of said circuits being closed when said members are maintained in a predetermined relationship, said other circuit being closed when said movable members are not maintained in said predetermined relationship, signalling means to indicate which of said circuits is closed and means exerting continuous force tending to move said movable members out of said predetermined relationship.

3. In combination, a miniature airplane comprising a fuselage having a plurality of relatively movable members mounted thereon, a fan blowing a blast of air past said movable members, spring means urging each of said movable members to one of its extreme positions, means operable against the action of said fan and said spring means to move said movable members into a predetermined relationship, a pair of alternative electrical circuits, one of said circuits being closed when said movable members are maintained in said predetermined relationship, and said other circuit being closed when said movable members are moved out of said predetermined relationship, and signalling means indicating which of said circuits is closed.

4. In combination, a miniature airplane having a movable rudder, a movable elevator, and movable ailerons, means constantly urging said movable members towards one extreme position, control means operable against said first mentioned means to move said rudder, elevator and ailerons, a fan blowing current of air past said airplane to simulate actual flight conditions, a pair of alternative electrical circuits, one of said circuits being closed when said airplane is maintained in a predetermined position, said one circuit being broken and said other circuit being closed when said airplane moves from said predetermined position and signalling means indicating which of said alternative electrical circuits is closed.

5. In combination, a miniature airplane mounted on a rod by means of a universal joint, a fan operable to blow air against said airplane, said airplane having movable rudder, a movable elevator and movable ailerons, control means operatively connected to said movable members to maintain said airplane in a predetermined position in said current of air in simulation of actual flight, said rod constituting one portion of an open electrical circuit, a metallic member secured to said airplane in proximity to said rod but spaced therefrom when said airplane is maintained in said predetermined position, said metallic member adapted to engage said rod to close said electrical circuit when said airplane moves out of said predetermined position, and signal means indicating when said electrical circuit is closed.

6. In an amusement device, a miniature airplane having movable parts and control means for moving said parts independently of each other, signalling means for indicating throughout a flight whether or not said airplane is being maintained in a predetermined position, and scoring means for recording the proportion of total operating time during said flight that said airplane is maintained in said predetermined position.

7. In combination, a miniature airplane mounted on a rod, said rod constituting one portion of an open electrical circuit, a metallic member secured to said airplane in proximity to said rod but spaced therefrom when said airplane is maintained in a predetermined position, a second circuit closed when said first circuit is open, a recording device in said second circuit, an electromagnetic relay in said first circuit, a switch in said seond circuit, said swith being controlled by said relay, whereby contact of said metallic member with said rod during operation of the device, whenever said airplane moves out of said predetermined position, closes said first circuit to energize said relay to open said switch, and signalling means indicating which of said circuits is closed.

MILTON N. TIGERMAN.